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U. S. DEPARTMENT OF AGRICULTURE

DIVISION OF CHEMISTRY

BULLETIN

No. 33

EXPERIMENTS

WITH

SUGAR BEETS

IN

1891

BY

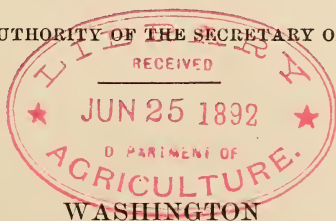
HARVEY W. WILEY

*Chemist of the U. S. Department of Agriculture and Director of the Department Sugar
Experiment Stations at Schuyler, Nebraska; Runnymede (Narcoossee P. O.),
Florida; and Sterling and Medicine Lodge, Kansas*

WITH THE COLLABORATION OF

Dr. WALTER MAXWELL, Prof. W. A. HENRY, and others

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1892

CIRCULARS OF INQUIRY.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF CHEMISTRY,
Washington, D. C., April 10, 1891.

SIR: Congress having made it the duty of the Department of Agriculture to examine into and report upon the extent and character of the adulteration of food, drugs, and liquors, it has been determined to ask information bearing upon the subject from chemists, druggists, manufacturers and dealers in food and drug products, as supplemental to the extended analysis already made by the chemists of the Department. Wishing to be thoroughly accurate and absolutely impartial, the fullest information is desired, and anything you can furnish bearing on the subject will be duly appreciated and judiciously used. Inclosed you will find penalty envelope for reply.

H. W. WILEY, *Chemist.*

A. J. WEDDERBURN,
Special Agent.

ADULTERANTS OF FOODS, DRUGS, AND LIQUORS.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF CHEMISTRY,
Washington, D. C., April 7, 1891.

The information desired is indicated by the following questions, to which full replies are earnestly requested:

1. What articles of food coming under your observation are adulterated?
2. What articles of drugs?
3. What articles of liquors?
4. What adulterants are used in any or all of the above articles?
5. Which, if any, of the adulterants are poisonous or injurious?
6. Which adulterants are noninjurious?
7. Are any beneficial?
8. Please furnish any other information bearing on the subject that will assist the Department to make an accurate and impartial report.

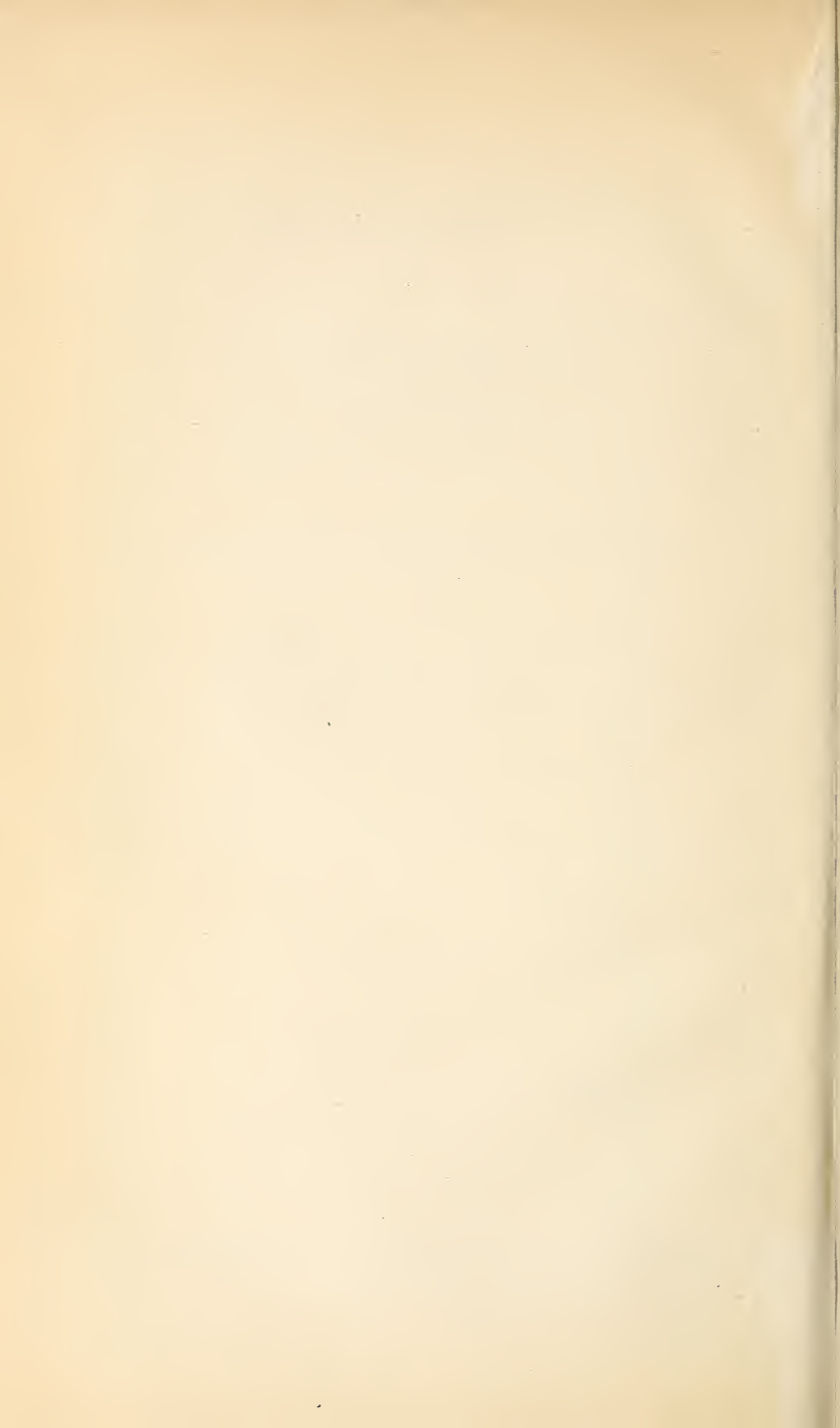
Date, _____.

NAMES OF STATE COMMISSIONERS.

H. K. Finseth, Commissioner, St. Paul, Minn.
Dr. C. W. Chancellor, Secretary, Baltimore, Md.
Dr. Benj. Lee, Secretary State Board of Health, 1532 Pine street, Philadelphia, Pa.
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A. C. Tupper, Dairy Commissioner, Des Moines, Iowa.

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LETTER OF TRANSMITTAL.

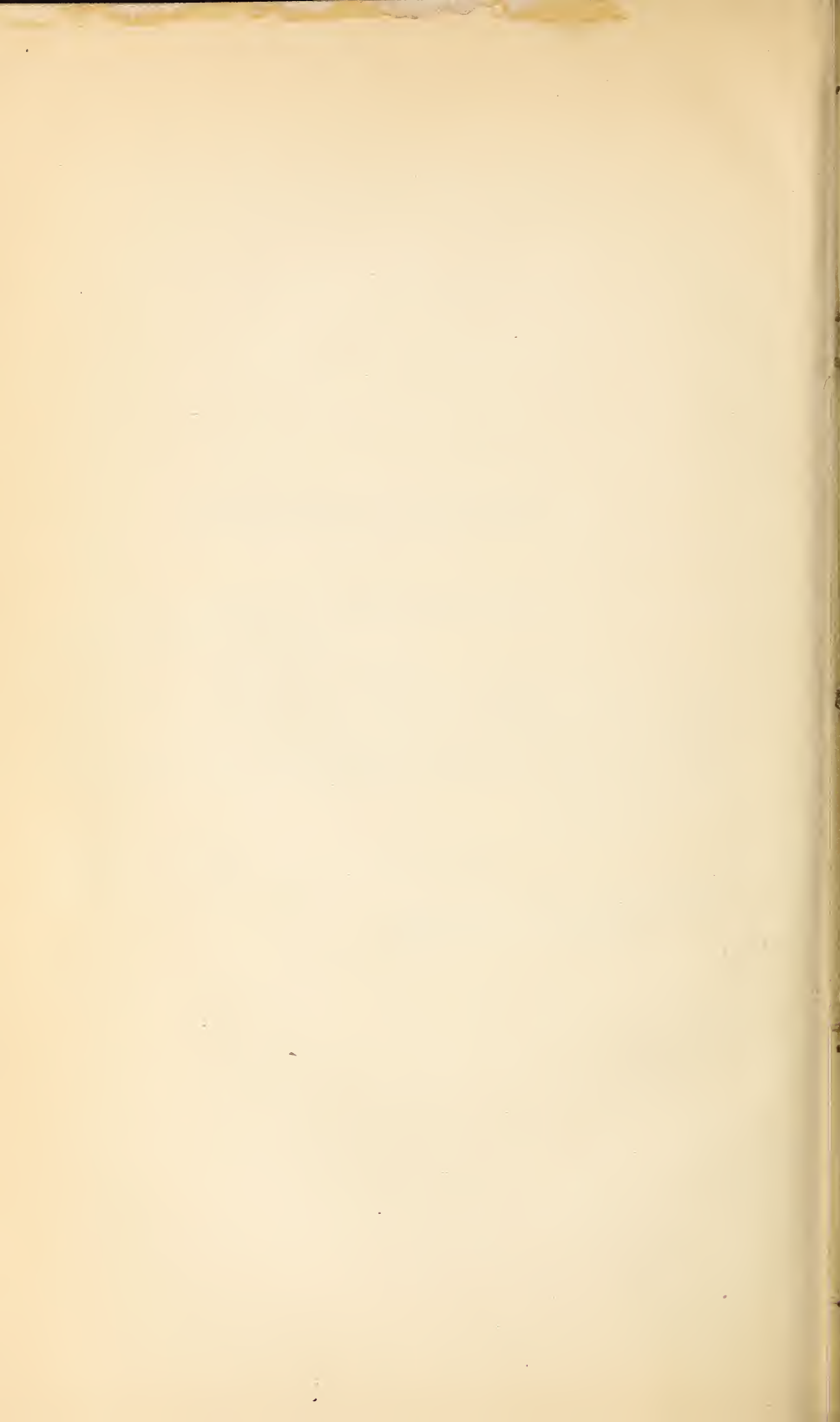
U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF CHEMISTRY,
Washington, D. C., February 27, 1892.

SIR: I have the honor to transmit herewith, for your inspection and approval, the manuscript of Bulletin No. 33, being a record of the experiments conducted by me, under authorization from you, on the culture of the sugar beet and the manufacture of sugar therefrom during the season of 1891.

Respectfully,

H. W. WILEY,
Chemist and Director of Beet Sugar Station.

Hon. J. M. RUSK,
Secretary of Agriculture.



EXPERIMENTS WITH SUGAR BEETS IN 1891.

The experiments conducted by the Department of Agriculture during the season of 1891 may be divided into three classes: (1) Culture of the sugar beet conducted by farmers in different parts of the country; (2) culture of the sugar beet conducted by the Agricultural Experiment Station of Wisconsin and numerous farmers in Wisconsin, under the direction of the Agricultural Experiment Station of that State, by authority of the Secretary of Agriculture; (3) experiments conducted at the beet-sugar experiment station of the Department located at Schuyler, Nebraska.

EXPERIMENTS CONDUCTED BY FARMERS IN DIFFERENT PARTS OF THE COUNTRY.

To meet the numerous demands for samples of sugar-beet seed received by the Department, 5½ tons of the best varieties of sugar-beet seed were purchased. Four tons of this consisted of equal portions of Kleinwanzlebener seed, grown by Dippe Brothers, of Quedlinburg, Germany, and Vilmorin's improved beet seed, grown by Vilmorin, Andrieux et Cie., of Paris, France. The other ton and a half consisted of Desprez, Lemaire, and Simon Legrand varieties, obtained from Mr. Henry T. Oxnard.

The beet seed was put up in packages averaging nearly 13 ounces each, making 15,000 packages. These were widely distributed, being sent to about 5,000 addresses. Many of those requesting several packages of seed made a subdistribution of them; so it is but fair to suppose that between 7,000 and 8,000 farmers received seed directly from the Department of Agriculture for experimental purposes.

Accompanying each package of seeds was a Farmers' Bulletin No. 3, containing full directions for the planting and cultivation of the beets. There were also sent to each one receiving a package of seed directions for taking samples of sugar beets for analysis and forwarding them to the Department. These directions were as follows:

DIRECTIONS FOR TAKING SAMPLES OF SUGAR BEETS FOR ANALYSIS.

U. S. DEPARTMENT OF AGRICULTURE,
Washington, D. C., July 1, 1891.

When the beets appear to be mature (September 15 to November 15, according to the latitude and time of planting) and before any second growth can take place, select an average row and gather every plant along a distance which should vary as follows, according to the width between rows:

From rows 16 inches apart, gather 75 feet; from rows 18 inches apart, gather 66 $\frac{2}{3}$ feet; from rows 20 inches apart, gather 59 $\frac{1}{3}$ feet; from rows 22 inches apart, 54 $\frac{2}{3}$ feet; from rows 24 inches apart, gather 50 feet.

The number of beets growing in the row, of the length above mentioned, must be counted. The tops are then to be removed, the beets carefully washed free of all dirt, wiped with a towel, and weighed. Where the row is not long enough to meet the conditions, take enough from the adjacent row or rows to make up the required length. The number of beets harvested multiplied by 435.6 will give the total number per acre. The total weight of beets harvested multiplied by 435.6 will give the yield per acre.

Rows of average excellence must be selected; avoid the best or poorest. Throw the beets promiscuously in a pile and divide the pile in two parts. This subdivision may be continued until there are about ten beets in a pile. Of these ten select two of medium size. Be careful not to select the largest or smallest. Wrap the beets carefully in paper and put your name thereon. Sew the beets up in a cotton bag, attach the inclosed shipping tag thereto, and send by mail.

Fill out blank describing beet, inclose in the envelope, and sew up in bag with beets.

No beets will be analyzed which are not sampled as described above and properly identified.

Miscellaneous analyses of samples without accurate description are of no value.

It is but just to the farmer and the Department that samples should be taken with the precautions required.

Blanks are sent to each one for two sets of samples. From two to four weeks should elapse between the times of sending the two sets of samples.

If additional analyses are required other blanks will be sent on application, but not more than four analyses can be made for any one person, except in special cases.

A model, showing how blanks should be filled out, is inclosed.

H. W. WILEY, *Chemist*.

There was also sent a blank for describing the samples taken, a copy of which, filled in, follows:

MODEL FOR DESCRIPTION OF SAMPLE OF SUGAR BEETS.

Variety	Kleinwanzlebener.
Date planted	May 2, 1891.
Date harvested	November 5, 1891.
Character of soil.....	black prairie loam; in cultivation for twenty years, chiefly in corn; level, tile-drained; last crop oats
Character of cultivation.....	plowed November, 1890, eight inches deep, subsoiled six inches; dug twice with disk harrow May 1, 1889; rolled; seed planted with hand drill one-half inch deep; hoed by hand May 16; thinned May 29 and 30; plowed with horse hoe May 28 and June 8, 16, 24, and July 3; no fertilizers used
Width between rows	18 inches.
Number of beets harvested.....	88
Total weight of beets harvested.....	80 pounds.
Weather.....	May, dry; June, copious rains; July, fine growing weather; August, hot and dry; September, dry until 24th, when a heavy rain fell.....
State.....	Iowa.
Post-office	Hanover, Buena Vista County.
Name.....	Robert Simpson.

The samples of beets for analysis began to be received in the Department in August and continued to arrive until February, 1892. The total number of samples received for analysis, January 1, 1892, was 1,605.

It is therefore seen that of the 5,000 original persons to whom packages were sent over 32 per cent responded by sending samples for examination. As soon as each sample of beets was analyzed a return was made to the sender in the following form:

REPORT OF ANALYSIS OF SAMPLE OF SUGAR BEETS.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF CHEMISTRY,
Washington, D. C., October 24, 1891.

From Clarence Reed; post-office, Vernonia; State, Oregon; variety, Kleinwanzlebener; number, 2; serial number, 15838:

Average weight of beets: Grams, 275; ounces, 9.

Sugar: Per cent in beets calculated from per cent sugar in juice, 15.67.

Sugar: Per cent in juice, 16.5.

Yield: Tons per acre, 17.

*Coefficient of purity, 83.9. †Probable yield of sugar per acre from a crop of 17 tons: pounds, 4,036.

Respectfully,

H. W. WILEY,
Chemist.

One of the most striking features in regard to this method of conducting experimental work is found in the fact that it is almost impossible to secure compliance with directions. It is evident at once that the value of experimental work depends upon the care with which it is done and the accuracy with which the directions prescribed are followed. It is not to be wondered at that farmers, busy with their other occupations, failed to comply with the minute directions necessary to secure the greatest advantage in experimental work.

Very few of the blanks were returned properly filled out. In many cases the data which were returned were palpably erroneous. In one instance a yield of 99 tons per acre was reported, and in a great many cases the yield per acre was so great as to show inaccuracy on the part of the measurement of the land or the weighing of the beets. In making out returns for such reported phenomenal yields the theoretical quantity of sugar per acre given was always questioned. We are accustomed to look with suspicion upon any yield of sugar beets which exceeds 25 tons per acre. While it is not impossible to secure a higher yield than this, and of beets of good saccharine quality, yet it is so rare as to throw doubt upon miscellaneous data showing an excess of that yield.

Another point which makes the returns obtained less valuable is found in the fact of the length of time which necessarily elapsed between the harvesting of the beets and their reception at the laboratory.

*The coefficient of purity is the per cent of sugar in the total solids of the juice of the beet.

†This number is only approximate, and shows the quantity of merchantable sugar which might be expected per acre from the yield, as reported by you, if manufactured by the best approved modern process.

Nearly all the samples received were from distant States, requiring for packages of this kind from three to eight days in the mails. Although the beets were in most cases well wrapped according to direction, our experiments have shown that they must have lost a considerable quantity of moisture by evaporation during their long transit. The data, therefore, showing the content of sugar in the juice would be uniformly too high for normal beets. It is estimated that not less than 10 to 15 per cent should in general be subtracted from the yield of sugar to express the normal percentage of sugar in the beets as originally harvested.

On account of the great number of samples received it was impracticable to determine the content of sugar directly in the beet pulp, either by cold instantaneous diffusion or by alcohol extraction. Recourse was had to the simpler method of calculating the quantity of sugar in the beet from the percentage of sugar found in the juice. This quantity was obtained by multiplying the percentage of sugar in the juice by 95 on the assumption that the beet contained 95 per cent of juice and 5 per cent of pulp. It is possible that, for the reasons above mentioned, this result is also too high, inasmuch as the beets having dried out would probably contain a larger percentage of pulp than that mentioned. At any rate the numbers give for all practical purposes the percentage of sugar which the beets contained and it was not intended that the analyses should be scientifically accurate. The comparisons among the beets received from different parts of the country must be considered just, with the exceptions before noted that some of them being longer in transit than others would suffer a greater loss of water. For this reason it would be expected that beets received from Washington and Oregon would show an apparently higher content of sugar than beets of equal original richness received from Maryland or Virginia.

The work of the Department has certainly resulted in great good in interesting people in all parts of the country in the problem of sugar-beet culture. The Secretary of Agriculture has, however, decided not to make as large a distribution of sugar-beet seed in the manner practiced during the past two years, but to concentrate his efforts in the development of a sugar-beet station, in which practical illustrations can be given of the very best methods of sugar-beet culture and the selection of mothers for the production of a high grade of seed.

In arranging the analyses of the samples of beets which have been sent in, they have been collected together by States and in the States by counties. The counties have been arranged alphabetically and all the samples from each county considered together and an average of the data from each county has been obtained. The averages for the States are made by samples, which gives the mean composition of all the beets in the State. In regard to the data by States it must be remembered that they can not be taken to represent actually the possibilities of each State in the growth of sugar beets. In the first place, the results of a single year

of culture, however carefully it may be conducted, could not be conclusive in regard to the possibilities of any one State or locality in the production of beets. In the second place, it must be understood that the farmers of different States may not have followed exactly the same method of sampling beets. In some of the cases, at least, where the general average of the State seems to run low it is found that the average weight of the beet was far above that which is required of a beet of high saccharine strength.

The results, therefore, must be simply regarded as tentative, showing in general where beets of fine quality can be produced, but not in any way deciding on the comparative ability of the several States for the production of rich beets.

The results of the analytical work arranged by States and counties are given in the following tables:

Summary of results by States and counties.

ARIZONA.

Serial No.	Name of grower.	County.	Variety.	Date received.	Saccharose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.
					Juice.	Beet.				
15003	Josiah Harbord	Maricopa	Kleinwanzlebener	Aug. 12	<i>Per ct.</i> 16.03	<i>Per ct.</i> 6.75	44.4	<i>Tons.</i>	<i>Pounds.</i>	<i>Ounces.</i>
15004	Charles D. Poston	do		Oct. 5	13.08	9.07	69.3			1,415
	Average of State				14.56	8.09	56.9			1,480
										51

ARKANSAS.

15005	Ed. A. Scott	Crawford		Nov. 15	11.43	7.65	7.27	65.8		505
15002	Casper Kniss	Sebastian	Belgian	July 24	11.20	5.80	5.51	51.8		1,740
	Average of State				11.42	6.73	6.39	58.8		1,123

CALIFORNIA.

15013	J. C. Merrill & Co.	Los Angeles	No. 1	Sept. 3	16.13	13.23	12.69	82.0		2,400
15014	do	do	No. 2	Sept. 3	15.33	11.61	11.03	75.8		2,220
15020	D. Freeman	do	French	Sept. 11	13.22	8.90	8.35	67.3		1,760
15192	do	do	Kleinwanzlebener	Oct. 7	16.38	11.08	11.09	71.3	10.5	680
15736	do	do	do	Oct. 22	13.78	10.25	9.74	74.3	23.7	950
15649	A. Boetto	do	Vilmorin	Oct. 20	16.59	14.05	13.35	84.7	3,095	34
15737	James Cook	do	Kleinwanzlebener	Oct. 22	13.28	9.20	8.74	69.1	18.0	660
15021	do	do	do	Sept. 11	17.24	14.17	13.46	82.2	4.4	780
	Average of State				15.21	11.64	11.06	75.8	2,188	1,305
								14.2		1,344

COLORADO.

15005	J. H. Tucker	Arapahoe	Kleinwanzlebener	Sept. 21	17.67	13.82	13.13	78.2		730
15064	do	do	do	Sept. 21	20.17	16.91	16.06	83.8		400
15067	do	do	Vilmorin	Sept. 21	17.97	14.49	13.76	80.6		840
15008	do	do	do	Sept. 21	20.07	16.16	15.35	80.5		260
15009	do	do	do	Sept. 21	18.47	16.16	15.35	87.5		610
15070	do	do	do	Sept. 21	19.87	15.85	15.06	79.9		500

15076	Jacob S. Yount	Arapahoe	Sept. 23	17.53	12.70	12.06	72.4	990	35
15077	do	do	Sept. 23	15.43	14.06	14.21	77.0	990	35
15148	Wm. Claussen	do	Oct. 3	19.03	11.94	11.34	77.4	640	23
16197	Henry Filze, sr	do	Nov. 2	21.31	17.25	16.39	81.9	455	16
15502	H. H. Fisher	do	Oct. 17	20.19	13.00	14.25	74.3	2,714	20
15503	do	do	Oct. 17	18.39	13.66	12.98	74.3	2,346	30
	Average			18.84	14.91	14.16	78.9	3,715	23
15571	J. S. Johnson	Cheyenne	Oct. 19	15.75	12.00	11.40	76.9	3,304	43
16299	Enos Piesonger	do	Nov. 9	16.35	11.50	10.93	70.3	347	37
	Average			16.05	11.75	11.17	73.6	1,856	43
*15502	H. H. Fisher	Clear Creek	Oct. 17	20.19	15.00	14.25	74.3	2,714	19
*15503	do	do	Oct. 17	18.39	13.66	12.98	74.3	2,546	28
	Average			19.20	14.33	13.62	74.3	2,630	25
15837	Chas. Hack	Costilla	Oct. 24	19.17	15.60	14.86	81.4	1,145	40
15984	Geo. F. Breninger	El Paso	Oct. 29	19.03	14.15	13.45	74.4	2,364	10
15376	do	do	Oct. 14	19.37	13.97	13.27	72.0	1,950	10
	Average			19.20	14.06	13.36	73.2	2,157	10
16230	B. T. Wright	Huerfano	Nov. 6	20.49	16.70	15.87	81.5	5,038	30
15414	Walter J. Quick	Larimer	Oct. 15	18.67	15.70	14.92	84.2	3,876	16
16338	do	do	Nov. 21	16.29	13.55	12.87	83.1	3,284	14
16300	C. S. Crandall	do	Nov. 9	19.77	14.90	14.16	78.1	8,360	26
16301	do	do	Nov. 9	20.77	17.85	16.96	83.9	2,917	16
16302	do	do	Nov. 9	20.77	18.50	17.58	89.1	5,793	11
16303	do	do	Nov. 9	20.97	19.50	18.53	93.0	4,727	6
16304	State agricultural station	do	Nov. 9	21.77	18.05	17.15	82.9	3,207	8
16305	do	do	Nov. 9	22.17	20.00	19.00	90.2	6,126	13
15376	do	do	Oct. 14	19.37	13.97	13.27	72.0	1,950	10
	Average			19.58	16.89	16.05	84.3	4,538	13
15413	Gus. Johnson	Logan	Oct. 15	17.35	11.90	11.30	63.6	1,957	19
15102	A. Nichols	Otero	Sept. 26	8.30	4.32	4.10	40.0	1,640	58
15118	B. U. Dye & Son	do	Sept. 28	9.54	5.62	5.34	56.0	1,580	56
15193	G. A. Perkins	do	Oct. 7	15.78	12.35	11.93	78.2	1,739	6
15290	R. W. Mayne	do	Oct. 10	12.18	7.85	7.46	64.3	1,905	11
15377	F. L. Watrous	do	Oct. 14	17.67	14.25	13.65	80.5	505	18
15654	A. L. Kellogg	do	Oct. 20	10.58	7.70	7.32	72.7	1,420	50
15824	R. W. Mayne	do	Oct. 24	16.67	13.25	12.59	79.5	3,576	11
16387	F. L. Watrous	do	Nov. 13	18.69	15.20	14.44	81.3	2,233	23

* These two analyses were erroneously credited to this county.

Summary of results by States and counties—Continued.
COLORADO—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
16416	Postmaster.....	Otero.....	Kleinwanzlebener.....	Nov. 14	15.85	Per ct. 11.10	Per ct. 10.55	70.0	.....	.....	335	12
16607	Geo. W. Swink.....	do.....	do.....	Nov. 30	21.03	18.10	17.19	86.0	.....	.....	1,070	38
16742	do.....	do.....	Vilmorin.....	Apr. 4	14.69	8.06	7.68	54.9	.....	.....	980	35
16743	do.....	do.....	do.....	Apr. 4	15.19	9.51	9.03	62.6	.....	.....	1,116	39
	Average.....				14.68	10.61	10.11	68.8	15.6	2,377	855	30
15048	C. M. Dille.....	Phillips.....	French.....	Sept. 19	16.11	12.02	11.42	74.6	.....	.....	1,360	48
15592	do.....	do.....	do.....	Oct. 19	15.55	9.30	8.84	66.0	.....	.....	2,490	88
15060	S. P. Richardson.....	do.....	Bulteau Desprez.....	Sept. 21	14.15	10.33	9.81	73.0	.....	.....	1,570	55
15474	do.....	do.....	do.....	Oct. 16	18.19	14.59	13.86	80.2	.....	.....	770	27
15061	C. G. Goller.....	do.....	Kleinwanzlebener.....	Sept. 21	17.05	11.92	11.32	68.9	14.8	2,115	1,470	52
15151	J. H. Zoll.....	do.....	Bulteau Desprez.....	Oct. 3	17.03	13.15	12.49	77.2	.....	.....	370	13
15504	do.....	do.....	do.....	Oct. 17	14.48	10.67	10.14	73.7	.....	.....	680	24
	Average.....				16.08	11.71	11.13	72.7	14.8	2,115	1,244	44
15942	Henry Holden.....	Yuma.....	Vilmorin.....	Oct. 27	22.24	18.70	17.77	84.1	4.6	1,211	120	4
15943	do.....	do.....	Kleinwanzlebener.....	Oct. 27	22.24	18.55	17.62	83.4	7.2	1,883	205	7
	Average.....				22.24	18.63	17.70	83.8	5.9	1,547	163	6
	Average of State.....				17.75	13.76	13.08	76.1	14.8	3,223	734	26

CONNECTICUT.

15284	Theodore A. Stanley	Hartford	Kleinwanzlebener	Oct. 10	14.08	9.42	8.95	66.9	5.1	551	810	29
15285	do	do	Vilmorin Improved	Oct. 10	11.38	8.73	8.29	72.9	7.1	582	390	14
15696	Thomas J. Stroud	do	White Silesian	Oct. 21	13.11	10.45	9.93	79.7	25.0	3,570	640	23
	Average				13.06	9.53	9.06	73.2	12.4	1,568	613	22
16541	P. H. Peterson	Tolland	French	Nov. 21	16.31	13.1	12.45	80.3	17	3,067	1,080	33
16542	do	do	German	Nov. 21	17.31	15	14.25	86.7	17	3,757	840	30
	Average				16.81	14.05	13.35	83.5	17	4,412	860	34
	Average of State				14.56	11.34	10.77	77.3	14.2	2,305	752	27

GEORGIA.

15981	Edwin D. Newton	Clarke	French	Oct. 29	19.53	13.4	12.73	68.6	217	8
15982	do	do	German	Oct. 29	16.03	9.8	9.32	61.1	440	16
	Average				17.78	11.6	11.03	64.9	329	12

IDAHO.

16060	Geo. Yager	Alturas	Bulteau Desprez	Oct. 31	17.87	13.4	12.73	74.9	430	15
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ILLINOIS.

15162	W. W. Kenney	Bureau	Vilmorin Improved	Oct. 5	20.41	16.11	15.20	78.9	440	16
16413	Palmer and Palmer	do	do	Nov. 14	14.05	11.15	10.59	74.6	1,500	56
16414	do	do	Kleinwanzlebener	Nov. 14	14.15	10.00	10.36	77.8	1,330	47
15291	R. H. Luckey	do	German	Oct. 10	13.18	9.25	8.82	70.0	1,270	45
16287	do	do	do	Nov. 9	14.35	10.50	9.98	73.2	1,650	58
	Average				15.41	11.58	11.03	74.9	1,256	44
16233	I. C. Eisenmayer	Clinton	German	Nov. 6	12.98	8.05	7.65	62.0	1,095	39
15828	Aug. Boehm	Cook	do	Oct. 24	16.37	13.00	12.35	79.9	1,230	43
15825	do	do	do	Oct. 24	17.97	14.75	14.02	81.8	1,230	43
15940	Jno. Miller	do	Vilmorin Improved	Oct. 27	17.54	14.80	14.07	84.3	1,310	46
	Average				17.29	14.18	13.48	82.0	1,256	44
16363	Arthur Chittenden	Cumberland	French	Nov. 13	17.59	13.15	12.49	75.3	1,257	44
15047	I. H. Gillum	Iroquois	Vilmorin	Sept. 17	13.41	9.87	9.38	73.6	700	25
15510	do	do	Vilmorin Improved	Oct. 19	13.58	9.55	9.07	70.3	870	31
15829	T. N. Marquis	do	Vilmorin	Oct. 24	16.97	12.28	11.67	75.2	460	16
16476	G. C. Smith	do	French	Nov. 17	16.37	12.75	12.11	77.9	1,150	41
	Average				15.08	11.11	10.56	74.3	795	28
15416	S. H. Weed	Henry	Kleinwanzlebener	Oct. 15	15.27	13.18	12.72	86.7	365	13
15417	do	do	Vilmorin	Oct. 15	17.37	14.25	13.54	81.7	2,736	15
	Average				16.32	13.72	13.13	84.2	398	14

Summary of results by States and counties—Continued.

ILLINOIS—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.		Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
					Per ct.	Per ct.	Juice.	Beet.				Tons.	Pounds.
15138	George Leigh	Kane	Kleinwanzlebener	Oct. 2	14.58	12.04	Per ct.	Per ct.	82.6	.....	.....	1,020	36
15143	do	do	Vilmorin	Oct. 2	14.38	11.80	11.21	11.21	82.0	.....	.....	1,350	48
	Average				14.48	11.92	11.33	11.33	82.3	.....	.....	1,185	42
15008	A. Stayner	Knox	Vilmorin	Aug. 29	16.19	12.38	11.75	11.75	76.4	.....	.....	350	12
15023	do	do	do	Sept. 14	14.49	10.26	9.75	9.75	70.8	.....	.....	505	18
15161	do	do	do	Oct. 3	14.87	10.67	10.14	10.14	71.8	.....	.....	385	14
15121	do	do	do	Sept. 29	13.77	8.77	8.33	8.33	63.7	.....	.....	495	17
	Average				14.83	10.52	9.99	9.99	70.7	.....	.....	434	15
15341	L. Warner	La Salle	French	Oct. 27	11.82	8.50	8.07	8.07	72.0	.....	.....	1,860	66
15105	G. F. Hughes	Lee	Kleinwanzlebener	Sept. 26	19.96	15.32	14.55	14.55	76.8	9.8	1,726	275	10
13742	J. G. Flock	do	German	Oct. 22	17.19	14.00	13.30	13.30	81.5	.....	.....	690	24
13743	do	do	French	Oct. 22	17.29	14.00	13.30	13.30	81.9	.....	.....	615	22
16242	Geo. S. Ransom	do	Kleinwanzlebener	Nov. 7	18.17	14.20	13.49	13.49	78.2	.....	.....	1,346	48
16385	Collins Dysart	do	do	Nov. 13	17.17	13.50	12.83	12.83	78.6	13.1	2,383	1,450	51
16386	do	do	Vilmorin Improved	Nov. 13	18.37	14.30	14.16	14.16	81.1	12.2	2,529	1,470	52
	Average				18.03	14.32	13.61	13.61	79.5	11.7	2,213	974	35
16647	Tony Schneider	McHenry	.....	Dec. 21	20.17	15.88	15.00	15.00	78.6	.....	.....	705	27
15511	Eli C. Fisk	Mason	Vilmorin	Oct. 17	15.28	11.08	10.53	10.53	72.5	.....	.....	410	15
15512	do	do	German	Oct. 17	16.99	12.97	12.34	12.34	76.5	.....	.....	370	13
16587	do	do	French	Nov. 27	16.59	13.10	12.44	12.44	78.9	.....	.....	1,070	38
	Average				16.29	12.38	11.77	11.77	76.0	.....	.....	617	22
16056	Jacob Le Pere, jr	St. Clair	French conical	Oct. 31	17.25	12.80	12.16	12.16	74.1	.....	.....	520	18
15611	P. W. Mendenhall	Vermillion	Vilmorin	Oct. 19	16.05	12.00	11.40	11.40	74.5	24.2	3,710	460	16
16286	do	do	Kleinwanzlebener	Nov. 9	16.15	12.40	11.73	11.73	76.8	20.0	3,266	415	15
	Average				16.10	12.20	11.59	11.59	75.7	22.1	3,488	438	16
	Average of State				16.09	12.34	11.73	11.73	76.4	18.7	2,798	894	32

INDIANA.

15059	Mary A. Loris.....	Bartholomew.....	Sept. 21	13.15	9.01	8.51	68.5	1,200	42
15197	Wm. Schlusmeier.....	French.....	Oct. 2	11.78	9.17	8.71	77.8	745	18
15393	do.....	do.....	Oct. 19	14.35	9.65	9.17	67.2	677	16
16284	do.....	do.....	Nov. 9	13.15	9.0	8.55	68.4	614	14
18144	T. W. Barriger.....	do.....	Oct. 2	14.38	11.47	10.90	79.8	500	18
15397	S. P. Snyder.....	do.....	Oct. 19	14.15	10.2	9.69	72.1	1,080	33
15398	A. J. Thomas.....	Vilmorin.....	Oct. 19	17.27	13.3	12.63	77.0	520	18
15176	Jas. Falkington.....	do.....	Oct. 6	11.55	7.65	7.26	66.2	550	19
15902	do.....	do.....	Oct. 26	14.95	10.60	10.07	70.9	460	16
	Average.....			13.86	10.01	9.50	72.0	633	22
15083	J. M. Snodgrass.....	Clinton.....	Sept. 24	16.56	13.93	13.23	84.1	2,311	23
15652	do.....	do.....	Oct. 20	17.39	14.65	13.92	84.2	2,351	19
	Average.....			16.98	14.29	13.58	84.1	2,453	21
16359	Geo. L. Bunker.....	Decatur.....	Nov. 13	13.49	14.2	13.5	76.8	245	9
16360	do.....	do.....	Nov. 13	16.87	12.0	11.40	71.1	390	14
	Average.....			17.93	13.1	12.45	73.95	317	12
15103	Samuel Harner.....	Grant.....	Sept. 27	15.94	12.13	11.52	76.1	670	24
15289	John Sherman.....	do.....	Oct. 10	14.78	11.64	11.05	73.6	965	34
15356	Abraham Daniels.....	do.....	Oct. 13	15.42	11.70	11.11	76.0	1,460	52
15357	do.....	French.....	Oct. 13	12.42	9.49	9.01	76.5	1,470	52
15358	Jacob Apple.....	do.....	Oct. 13	13.02	9.78	9.30	75.2	535	19
15359	Geo. Welsenbarger.....	German.....	Oct. 13	13.42	10.10	9.69	75.4	1,065	37
15360	Wm. Gowin.....	do.....	Oct. 13	14.12	11.57	10.93	82.0	655	23
15361	Stephen M. Gowin.....	German.....	Oct. 13	13.12	8.58	8.15	65.3	1,010	36
15377	Jno. S. Pence.....	French.....	Nov. 27	14.88	11.8	11.21	79.3	970	34
15378	Isaac Gentis.....	do.....	Nov. 27	13.38	12.5	11.88	81.3	1,960	69
15379	T. J. Creviston.....	do.....	Nov. 27	15.39	13.0	12.35	83.3	610	22
	Average.....			14.37	11.12	10.77	77.2	1,034	37
15079	F. B. Pfaff.....	Hamilton.....	Sept. 23	13.21	9.64	9.16	73.0	2,180	77
16234	do.....	do.....	Nov. 6	13.19	14.0	13.35	76.9	685	24
16235	do.....	do.....	Nov. 6	15.98	12.0	11.40	75.1	725	26
16460	do.....	do.....	Oct. 16	16.25	11.6	11.02	71.4	303	11
15987	L. F. Nurdyke.....	Bulteau Desprez.....	Nov. 29	15.03	11.8	11.21	78.5	1,760	62
16241	do.....	do.....	Nov. 7	16.67	13.15	12.49	78.9	1,670	59
	Average.....			15.89	12.03	11.44	75.6	1,221	43
15189	E. Stoltzer.....	Henry.....	Oct. 7	16.29	13.93	13.23	85.5	340	12
15190	do.....	do.....	Oct. 7	17.09	13.90	13.20	81.7	410	14
	Average.....			16.69	13.92	13.22	83.6	375	13

Summary of results by States and counties—Continued.

INDIANA—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Grains.	Ounces.
15733	E. W. Baker	Howard	German	Oct. 22	15.28	Per ct.	Per ct.	Per ct.	Tons.	Pounds.	Grains.	Ounces.
16122	Gurney Lindley		Kleinwanzlebener	Nov. 2	15.59	11.25	10.69	73.5	16.8	2,423	1,025	36
16283	Robt. Massey		do	Nov. 9	14.65	10.25	10.03	73.1			970	34
16644	E. E. McLane		do	Dec. 21	18.77	15.42	14.65	70.0			1,680	59
	Average				16.07	12.11	11.28	74.7	16.8	2,423	1,114	39
15921	H. H. Grissom	Jay	German	Oct. 12	14.68	10.78	10.24	73.4	18.7	2,536	425	15
16297	T. L. Stratton		do	Nov. 14	21.17	17.60	16.72	83.1	12.2	3,060	575	20
15086	C. H. Holly		do	Sept. 24	16.54	12.16	11.55	73.5	18.9	2,895	600	21
16643	do		do	Dec. 21	17.47	13.47	12.81	77.0	19.6	3,489	550	20
	Average				17.47	13.50	12.83	76.8	17.4	2,995	538	19
15178	E. S. Carter	Johnson	French	Oct. 6	13.85	10.55	10.2	76.1	6	826	980	35
15115	Lewis Krepper		Vilmorin Improved	Sept. 28	16.39	13.13	12.47	80.1	24	4,330	745	26
15320	Jno. Frazier		Kleinwanzlebener	Oct. 12	15.78	10.89	10.35	69.0			710	25
15382	J. M. Smith		Vilmorin	Oct. 14	17.47	14.73	13.89	84.3			530	19
15476	T. L. Hammond	do	Kleinwanzlebener	Oct. 16	12.48	11.21	10.65	90.0			1,550	55
15594	A. T. Cook		French	Oct. 19	15.85	13.00	12.35	81.9	19.6	3,379	240	8
15595	Peter Edler		Lane's Imperial	Oct. 19	13.95	9.69	9.12	68.8			760	27
15596	Frank Bartz.		Vilmorin	Oct. 19	14.45	11.35	10.78	78.50	22.9	3,499	645	23
15651	E. F. Dield	do	do	Oct. 20	17.69	14.65	13.92	82.80	4.4	884	290	10
15653	F. G. Bent		German	Oct. 20	15.28	11.95	11.35	78.2	18.5	2,955	355	13
15734	H. H. Dorsey		French	Oct. 22	16.29	13.00	12.35	80.0			560	20
16055	Nicholas Cook		do	Oct. 31	18.97	15.70	14.91	78.6			595	21
16285	H. H. Johnson	do	Vilmorin Improved	Nov. 9	16.15	12.20	11.59	75.6	6.2	980	975	34
16415	John Catey		Kleinwanzlebener	Nov. 14	29.77	15.80	10.3	76.1	22.9	4,733	420	15
16564	S. D. Anglin		do	Nov. 24	15.89	12.80	12.16	86.7			1,430	51
16565	do		Vilmorin	Nov. 24	16.01	12.75	12.11	80.5			1,060	37
15508	A. J. Thomas	do	do	Oct. 19	17.27	13.30	12.63	77.0			1,080	38
	Average				16.09	18.88	11.93	79.5	15.9	2,994	747	26
15735	J. Haines	Madison	Vilmorin	Oct. 22	17.29	14.25	13.54	82.3	7.8	1,569	370	13
16583	Robt. C. Smith		Kleinwanzlebener	Nov. 27	16.79	13.30	12.64	79.1			580	21
15080	James Powell	Perry	Vilmorin Improved	Sept. 2	14.54	11.34	10.77	78.0	17.9	2,484	1,050	36

15399	do	do	Kleinwanzlebener	Oct. 15	15.55	9.36	8.89	60.0	.....	.....	500	18
	Average				15.05	10.35	9.83	69.0	.....	2,484	765	27
15477	Jos. W. Mills	Randolph	German	Oct. 16	14.58	11.28	10.72	77.4	.....	.....	830	29
15478	Jacob M. Barker	do	French	Oct. 16	14.68	11.34	10.77	77.6	.....	.....	750	26
	Average				14.63	11.31	10.75	77.5	.....	.....	790	28
15122	C. A. Porter	Shelby	Kleinwanzlebener	Oct. 1	15.65	11.81	11.22	75.4	.....	.....	870	31
15501	do	do	do	Oct. 7	15.38	11.34	10.77	73.7	.....	.....	1,080	38
16282	do	do	do	Nov. 9	17.77	14.15	13.44	79.7	.....	.....	620	22
	Average				16.27	12.43	11.81	76.2	.....	.....	857	30
15831	Mrs. T. C. Bailey	Tippicanoe	Bulteau Desprez	Oct. 24	14.75	11.50	10.93	77.9	.....	.....	510	18
16443	Frederick Hauptz	Wabash	Kleinwanzlebener	Nov. 16	18.23	15.70	14.92	86.0	.....	.....	880	31
16444	do	do	do	Nov. 16	13.73	12.50	11.88	91.1	.....	.....	383	14
16496	W. H. Bent	do	German A	Nov. 19	17.53	14.60	13.87	83.3	.....	.....	1,210	43
16497	do	do	German B	Nov. 19	17.53	14.60	13.87	83.3	.....	.....	1,230	44
16498	Warren Bigler	do	French A	Nov. 19	20.03	12.0	11.40	59.9	.....	.....	1,040	37
16499	do	do	German B	Nov. 19	15.83	11.3	10.74	71.4	.....	.....	670	24
16554	Banner McCowen	do	do	Nov. 23	18.91	14.0	13.30	74.0	.....	.....	610	20
16555	do	do	do	Nov. 23	23.54	18.5	17.58	70.1	.....	.....	440	16
	Average				18.17	14.15	13.45	77.4	.....	.....	808	30
15380	George R. Clayton	White	Vilmorin	Oct. 14	18.37	14.52	13.79	79.0	.....	.....	625	22
15381	do	do	do	Oct. 14	19.47	15.40	14.63	79.6	.....	.....	2,899	14
	Average				18.92	14.96	14.21	79.3	.....	.....	515	18
	Average for State				15.97	12.32	11.64	76.9	.....	.....	794	27

INDIAN TERRITORY.

16580	Arthur E. Wilson	Chickasaw	Kleinwanzlebener	Nov. 27	15.99	13.05	12.40	81.6	1,215	43
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15273	M. Geide	Allamakee	French	Oct. 10	14.2	11.0	10.5	77.7	1,685	59
15274	do	do	German	Oct. 10	15.0	11.0	10.5	73.3	1,630	58
15634	Enoch Miller	do	French	Oct. 20	14.5	11.1	10.6	76.7	.....	.....	735	26
15635	do	do	German	Oct. 20	16.6	13.4	12.7	80.5	.....	.....	1,615	57
15771	C. Barnard	do	do	Oct. 23	16.0	12.7	12.1	79.5	.....	.....	940	33

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sugar in —		Purity.	Yield, beets per acre.	Probable yield sugar per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
15772	C. Barnard	Allamakee	German	Oct. 23	14.9	Per ct. 10.60	Per ct. 10.10	Per ct. 71.4	Tons.			1,315
15773	do	do	do	Oct. 23	14.9	11.40	10.80	76.4				1,345
15774	do	do	French	Oct. 23	16.1	13.60	12.90	81.6				715
15818	Jos. Schrieber	do	German	Oct. 24	17.8	14.40	13.60	81.3				880
15823	do	do	French	Oct. 24	17.4	13.60	12.90	78.9				820
15877	J. A. Carlson	do	German	Oct. 26	15.0	9.40	8.90	62.6				1,140
15881	do	do	French	Oct. 26	15.4	10.60	10.00	60.6				1,010
16195	G. J. F. Nowell	do	German	Nov. 5	15.5	11.50	10.90	73.9				1,520
16196	do	do	French	Nov. 5	15.1	11.30	10.70	74.3				1,855
16227	Lundelin Haas	do	do	Nov. 6	22.8	19.20	18.20	84.0				720
16228	do	do	German	Nov. 6	21.9	18.30	17.40	83.6				560
16308	Wm. Lust	do	do	Nov. 14	21.5	18.30	17.40	85.0				1,120
16399	do	do	French	Nov. 14	21.0	18.40	17.40	87.5				945
	Average				16.98	13.32	12.64	77.8				1,151
15071	H. R. Pierce	Audubon	Kleinwanzlebener	Sept. 16	12.72	8.27	7.86	65.0				1,950
15126	Jos. Schuchart	Benton	Vilmorin Improved	Sept. 29	14.3	10.20	9.70	70.7	22.2	2,735	780	28
15637	do	do	do	Oct. 1	16.1	11.80	11.20	73.1			605	21
15886	Wm. Rinderknecht	do	Kleinwanzlebener	Oct. 26	17.5	14.20	13.50	81.0			970	34
15887	do	do	French	Oct. 26	15.4	12.50	11.90	81.3	25	4,258	850	30
15165	Wm. B. Mueller	do	Kleinwanzlebener	Oct. 5	14.4	9.40	8.90	65.3			950	34
15166	do	do	Vilmorin	Oct. 5	14.1	9.30	8.70	68.7			1,050	37
	Average				15.3	11.3	10.7	73.4	23.6	3,517	868	31
15726	A. J. Norris	Black Hawk	French	Oct. 22	14.98	11.75	11.16	78.4			420	15
16093	J. M. Overman	do	do	Nov. 2	17.31	13.25	12.39	76.5			1,300	48
	Average				16.15	12.50	11.88	77.5			890	32
15514	F. G. Bennett	Boone	Vilmorin	Oct. 17	16.29	13.58	12.90	83.4	13.7	2,659	445	16
16427	do	do	Kleinwanzlebener	Nov. 14	20.23	17.35	16.48	85.8	15.9	4,059	569	20
16141	Jacob Scherholz	do	do	Nov. 3	19.77	14.20	13.49	71.8	21.0	3,631	415	15
16142	do	do	Vilmorin Improved	Nov. 3	17.27	14.25	13.54	82.5	19.1	3,850	570	20
16224	B. R. Moxley	do	do	Nov. 6	17.69	15.10	14.35	85.8			895	28
	Average				18.23	14.90	14.15	81.9	17.4	3,550	559	20

15791	Wm. A. Rogers	Buchanan	Kleinwanzlebener	Oct. 23	18.57	15.70	14.92	84.6	16.1	3,664	498	18
16006	A. M. Bingham	do	Vilmorin Improved	Oct. 30	17.09	13.35	12.69	78.0	8.6	1,516	785	25
	Average				17.63	14.53	13.81	81.4	12.4	2,590	642	23
16453	L. Traub	Buena Vista	Vilmorin	Nov. 16	23.57	19.20	18.2	81.2			380	13
16454	do	do	Kleinwanzlebener	Nov. 16	23.70	20.60	19.6	87.0			360	13
	Average				23.64	19.90	18.9	84.1			370	13
15083	J. A. Landes	Butler	French	Sept. 24	13.74	10.18	9.67	75.5			1,990	70
15087	F. B. Cheney	do	do	Sept. 24	12.74	9.25	8.79	72.6			1,740	61
15095	Andrew Globery	do	German	Sept. 25	15.51	12.15	11.54	78.3			550	19
16132	do	do	do	Nov. 3	17.45	14.30	13.59	81.9			795	24
15351	Frank Beale	do	do	Oct. 13	16.71	13.87	13.17	83.0			690	24
	Average				15.23	11.95	11.35	78.3			1,153	40
15064	F. E. Hamilton	Calhoun	White conical	Sept. 21	13.35	9.76	9.26	73.1			1,945	79
16091	J. C. Frick	do	Kleinwanzlebener	Nov. 2	16.91	13.25	12.59	78.4			2,044	27
16066	E. E. Johnson	do	Vilmorin Improved	Nov. 2	17.71	13.65	12.92	77.1			650	23
	Average				17.04	15.18	14.44	89.2			580	20
16382	S. B. Alspach	Carroll	Vilmorin Improved	Nov. 13	16.25	12.96	12.30	79.5			1,061	37
15107	E. Gingery	Cass	Vilmorin Improved	Sept. 28	13.97	8.44	8.02	60.0			740	26
15210	do	do	do	Oct. 8	12.58	8.55	8.13	68.0			2,070	73
15167	S. Carver	do	German	Oct. 23	14.45	10.60	10.07	73.4			2,240	73
15768	do	do	French	Oct. 23	16.67	12.75	12.11	76.5			1,386	49
15728	J. M. Lehman	do	Kleinwanzlebener	Oct. 22	13.88	12.04	11.78	78.0			1,040	37
16576	do	do	Vilmorin Improved	Nov. 27	17.28	12.80	12.16	74.1			730	26
15247	R. White	do			11.13	7.66	7.28	69.0			1,520	54
	Average				14.57	10.41	9.94	71.3			1,389	49
15418	C. L. Schiele	Cedar	Kleinwanzlebener	Oct. 15	14.35	10.91	10.36	74.4			158	6
15639	G. W. Barclay	do	do	Oct. 20	15.89	12.70	12.07	80.0			795	28
15640	do	do	Vilmorin Improved	Oct. 20	16.59	13.20	12.54	79.5			465	16
15641	do	do	Champion	Oct. 20	13.78	9.40	8.93	68.2			1,110	39
	Average				15.15	11.55	10.98	75.5			632	22
16089	H. Graff	Cherokee	French	Nov. 2	13.39	9.40	8.93	70.2			780	28
16450	do	do	do	Nov. 16	13.00	11.10	10.50	74.0			1,015	57
	Average				14.20	10.25	9.72	72.1			3,350	43
15310	G. I. Armitage	Clarke	Conical	Oct. 12	17.08	9.20	8.74	53.9			290	10
16599	J. Schmidt	Clay	Vilmorin	Nov. 29	16.8	13.30	12.60	78.8			610	22

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.		Sucrose in—		Purity.	Yield beets per acre.	Probable yield sugar-crope per acre.	Average weight of beets.	
					Per ct.	Boet.	Per ct.	Boet.				Grains.	Ounces.
16600	J. Schmidt.	Clay	Kleinwanzlebener	Nov. 29	17.8	14.8	14.65	13.30	82.9	25	4,475	730	26
	Average				17.3	14.65	13.30	80.9				670	24
16605	F. E. Mohr	Clayton	Kleinwanzlebener	Aug. 25	15.29	9.10	8.65	59.6				765	27
16625	do	do	do	Sept. 14	16.29	13.15	12.50	80.7				1,240	44
16255	J. W. X. Smith	do	do	Nov. 7	16.15	12.40	11.80	75.9				980	25
16256	do	do	do	Nov. 7	16.37	13.16	12.40	78.8				500	18
	Average				16.15	11.94	11.34	73.6				871	31
15461	C. C. Paeth	Crawford	Kleinwanzlebener	Oct. 16	13.28	9.34	8.87	70.3				1,610	57
15919	A. F. Bond	do	Conical	Oct. 27	13.62	9.50	9.02	69.8				1,030	36
16634	H. Konekamp.	do	German	Dec. 7	19.24	15.15	14.40	78.8				1,030	36
	Average				15.38	11.33	10.76	73.0				1,223	43
15477	L. L. Feather	Dallas	Vilmorin Improved.	Oct. 6	17.37	14.46	13.74	83.2				400	17
15466	do	do	Kleinwanzlebener	Oct. 13	15.02	12.34	11.72	82.2				600	24
15419	J. H. Conley	do	Vilmorin	Oct. 15	15.05	10.50	9.98	66.9				620	22
15420	do	do	do	Oct. 15	17.37	13.28	12.62	73.6				510	19
15421	do	do	Kleinwanzlebener	Oct. 15	17.37	13.69	13.00	79.8				415	15
15810	do	do	do	Oct. 24	17.27	12.70	12.00	73.5				529	18
15822	do	do	Kleinwanzlebener	Oct. 24	15.95	11.60	10.92	72.3				815	29
15879	do	do	Vilmorin Improved.	Oct. 26	15.75	11.30	10.73	71.7				610	23
16251	do	do	Vilmorin	Nov. 7	18.27	13.90	13.24	76.1				670	24
16252	do	do	Kleinwanzlebener	Nov. 7	17.17	14.20	13.49	80.0				710	26
16253	do	do	Vilmorin	Nov. 7	16.87	12.60	11.97	74.7				600	23
16253	do	do	Kleinwanzlebener	Oct. 20	16.89	13.50	12.83	80.0				755	27
16648	W. A. Ulum	do	do	Oct. 22	18.39	14.25	13.54	77.5				420	15
15723	Geo. Roberts	do	do	Oct. 23	13.95	10.00	9.50	71.7				765	27
15769	Lindsay Willis	do	Vilmorin	Oct. 23	14.45	11.25	10.69	77.8				910	32
15766	T. J. Jones	do	Kleinwanzlebener	Oct. 26	16.05	10.55	9.92	70.1				595	21
15878	Adelbert Thornburg	do	Vilmorin Improved	Oct. 26	17.71	14.50	13.77	81.6				570	20
15884	Truman Buck	do	Kleinwanzlebener	Oct. 27	16.22	12.30	11.69	75.8				610	23
15924	Martin O. Malley	do	do	Oct. 27	16.47	13.45	12.78	81.7				600	24
15770	W. Pepper	do	do	Oct. 23	16.47	13.45	12.78	81.7				3,282	24
	Average				16.47	12.65	11.96	76.3				638	23
16350	J. S. Stark	Davis		Nov. 10	18.1	10.8	10.2	59.5				610	22

16253	M. W. Blair	Des Moines	Vilmorin Improved	Nov. 7	18.70	14.50	13.80	77.7	21.3	4,115	1,080	38
16254	do	do	Kleinwanzleben	Nov. 7	19.80	14.50	13.80	73.3	14.6	2,660	865	30
	Average				19.25	14.50	13.80	75.5	18.0	3,388	973	34
16226	R. R. Wilcox	Dickinson	French	Nov. 6	14.70	11.30	10.7	76.7	16.3	2,422	415	15
16598	J. W. Bapp	Fayette	Kleinwanzleben	Nov. 29	16.00	11.05	10.09	71.9			735	26
15218	Isaac Bird	Franklin	Kleinwanzleben	Oct. 8	14.58	10.48	9.95	71.9	20.0	2,584	365	13
16133	do	do	do	Nov. 3	18.20	13.30	12.60	73.3	18.9	3,147	380	13
15588	H. Boddy	do	Kleinwanzleben	Oct. 19	14.75	11.50	10.93	78.6			810	29
16191	do	do	do	Nov. 5	16.40	12.50	11.90	75.9	18.5	3,010	1,545	55
16193	Wm. Packier	do	do	Nov. 5	19.50	15.30	14.50	78.6	18.7	3,756	990	35
16194	John Hayes	do	do	Nov. 5	18.10	13.80	13.10	76.1			1,020	36
15389	Adam Keller	do	Kleinwanzleben	Oct. 19	13.85	12.35	11.73	77.9	15.2	2,572	750	26
	Average				16.77	12.75	12.10	76.0	18.30	3,014	837	30
16345	John Decker	Green	German	Nov. 10	17.20	13.50	12.80	78.5			925	33
16346	do	do	French	Nov. 10	15.90	11.60	11.00	72.8			1,210	43
16348	A. J. Dudley	do	German	Nov. 10	18.70	14.20	13.40	75.7			1,220	47
16354	Carl Dennervert	do	Kleinwanzleben	Nov. 10	19.50	15.00	14.30	77.0			1,550	55
	Average				17.83	13.58	12.88	76.0			1,226	44
15669	E. Rockhill	Grundy	Vilmorin	Oct. 19	14.55	11.90	11.31	81.8			780	28
16225	do	do	do	Nov. 6	17.09	14.05	13.35	82.2	20.9	4,140	605	21
15729	Henry Bash	do	do	Oct. 22	13.58	9.85	9.36	72.6	24.0	2,945	855	30
	Average				15.07	11.93	11.34	78.9	22.5	3,543	747	26
15081	Wm. Oxley	Hancock	French	Sept. 24	13.24	9.67	9.18	73.0			1,910	68
16042	do	do	do	Oct. 31	16.15	11.50	10.93	71.2			1,000	35
	Average				14.70	10.59	10.06	72.1			1,455	52
15136	W. A. Lesh	Hardin	Vilmorin Improved	Oct. 2	16.29	13.24	12.58	81.2	19.0	3,504	500	21
15186	L. W. Price	do	White	Oct. 6	14.85	11.10	9.60	74.8			450	16
15880	J. J. Thornton	do	Vilmorin Improved	Oct. 26	18.37	14.40	13.68	78.4			445	16
16351	do	do	do	Nov. 11	17.79	13.30	12.64	78.0			580	19
15882	Jonathan Edgington	do	Kleinwanzleben	Oct. 26	16.05	12.25	11.64	76.3			565	20
15764	do	do	do	Oct. 23	15.05	12.20	11.59	81.1			625	22
15881	J. F. Martin	do	Vilmorin Improved	Oct. 26	16.05	11.70	11.11	68.2	20.3	2,818	600	21
16349	do	do	do	Nov. 11	17.89	14.35	13.63	80.2	20.3	4,000	675	24
16452	C. Clausung	do	French	Nov. 16	18.67	16.00	15.20	85.7			870	31
	Average				16.78	13.17	12.41	78.0	19.9	3,441	594	21
15018	F. J. Porter	Harrison	Kleinwanzleben	Sept. 19	9.40	5.60	5.30	60.1			2,315	82
15052	H. E. Buxton	do	do	Sept. 19	13.60	9.30	8.80	65.4			660	23

15578	A. Foehlinger	Malaska	Oct. 19	12.05	8.50	7.60	70.5	---	---	---	725
15579	do	do	Oct. 19	12.64	7.20	6.84	57.0	---	---	---	735
15580	Mel I. Freeman	do	Oct. 19	14.85	9.15	8.69	71.2	---	---	---	1,520
15581	W. H. Whitmer	do	Oct. 19	12.65	10.70	10.16	73.0	---	---	---	750
15582	J. G. Harrold	do	Oct. 19	15.85	12.00	11.40	75.8	---	---	---	1,215
15583	A. W. Swahn	do	Oct. 19	16.97	13.00	12.35	76.6	---	---	---	745
15587	do	do	Oct. 19	15.05	11.60	11.02	77.1	---	---	---	905
15584	T. E. Whitacre	do	Oct. 19	15.25	13.10	12.45	86.0	---	---	---	905
15585	E. T. Ryan	do	Oct. 19	16.65	12.05	11.45	72.4	---	---	---	900
15586	Eli Keener	do	Oct. 19	15.75	11.85	11.26	75.2	---	---	---	905
15588	Jacob Alder	do	Oct. 30	16.80	12.20	11.59	73.4	---	---	---	825
15589	John Wilt	do	Oct. 30	18.59	14.35	13.63	77.2	---	---	---	840
15590	John Moore	do	Oct. 30	13.78	10.15	9.63	73.6	---	---	---	820
15591	J. H. Denberger	do	Oct. 30	14.28	9.80	9.30	69.6	---	---	---	885
15592	Wm. Tormeaill	do	Oct. 30	19.09	14.40	13.68	73.5	---	---	---	725
15593	Perry F. Edris	do	Oct. 30	13.88	11.10	10.58	70.0	---	---	---	680
15594	John Moody	do	Oct. 30	15.10	10.80	10.27	68.0	---	---	---	480
15598	do	do	Oct. 30	13.08	10.50	9.97	69.6	---	---	---	16
15597	D. C. Garwood	do	Oct. 30	15.08	10.70	10.16	72.6	---	---	---	450
15595	do	do	Oct. 30	21.19	17.20	16.34	81.2	---	---	---	3,135
15599	J. E. Lord	do	Oct. 30	20.49	16.00	15.20	78.1	---	---	---	215
16000	W. A. Bryan	do	Oct. 30	20.09	17.25	16.39	85.9	---	---	---	1,665
16001	Jno. D. Thomas	do	Oct. 30	13.58	9.75	9.25	71.8	---	---	---	270
16002	Jno. D. Thomas	do	Oct. 30	16.59	12.70	12.07	76.5	---	---	---	1,475
16003	Wm. Pickrell	do	Oct. 30	14.58	9.65	9.17	66.3	---	---	---	485
16004	J. Hull	do	Oct. 30	16.18	11.75	11.16	72.6	---	---	---	475
15575	do	do	Oct. 19	15.08	10.50	9.97	69.6	---	---	---	1,130
15576	S. L. Sherman	do	Oct. 19	12.75	8.75	8.42	68.7	---	---	---	1,075
	Average	do	Oct. 19	14.15	11.30	10.73	80.0	---	---	---	1,055
								23.5	---	---	1,160
15072	D. H. Litchfield	Marion	Sept. 22	15.78	11.69	11.09	73.7	---	---	---	797
15642	G. E. Koorda	do	Oct. 20	14.83	9.83	9.34	66.3	---	---	---	3,056
15623	P. J. Koelma	do	Oct. 27	12.78	9.00	8.55	70.4	---	---	---	1,972
15582	Jno. E. Koorda	do	Oct. 10	13.29	8.85	8.41	67.0	---	---	---	1,285
	Average	do	Oct. 10	12.68	8.93	8.48	70.3	---	---	---	1,105
								---	---	---	712
15167	W. H. Weatherly	Marshall	Oct. 5	13.40	9.15	8.70	68.5	---	---	---	1,046
15182	Eugene Wood	do	Oct. 6	10.30	5.60	5.30	53.8	---	---	---	450
15976	do	do	Oct. 29	16.50	13.30	12.90	82.3	---	---	---	650
15183	J. H. Chinn	do	Oct. 6	13.60	9.10	8.70	67.2	---	---	---	3,090
16424	do	do	Nov. 16	16.30	12.20	11.60	74.4	---	---	---	560
15220	Stewart Bosworth	do	Oct. 8	15.70	11.90	11.20	75.3	---	---	---	490
16294	do	do	Nov. 8	17.80	13.60	12.90	76.3	---	---	---	440
15221	J. E. Brush	do	Oct. 9	12.30	9.30	8.80	75.3	---	---	---	535
15249	W. T. Berry	do	Oct. 9	15.00	11.10	10.60	74.3	---	---	---	1,090
15278	J. G. Brown	do	Oct. 10	15.30	11.00	10.50	71.7	---	---	---	37
16131	do	do	Nov. 3	20.20	17.10	16.20	84.5	---	---	---	1,065
15283	G. W. Horst	do	Oct. 10	15.40	11.80	11.20	76.9	---	---	---	500
15313	G. L. Fraser	do	Oct. 12	16.70	13.30	12.70	79.7	---	---	---	365
15345	A. M. Miller	do	Oct. 13	14.30	11.60	11.00	81.2	---	---	---	615
								5.6	---	---	400
								---	---	---	340

Summary of results by States and counties—Continued.

IOWA—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
15347	Henry Moler	Marshall	German	Oct. 13	13.20	Per ct. 7.60	Per ct. 7.20	57.3	Tons.		690.	24
15349	J. M. Rhodes	do	Vilmorin	Oct. 13	15.50	12.40	11.60	80.0			400	14
15367	J. A. Tallman	do	German	Oct. 19	12.00	8.20	7.80	68.7			725	26
15374	George Whittom	do	do	Oct. 19	12.70	8.60	8.20	68.0			433	16
15366	W. H. Stacy	do	Kleinwanzlebener	Oct. 20	15.50	12.50	11.90	80.7			690	24
15644	do	do	do	Oct. 20	14.30	11.30	10.70	78.8	13.3	2.031	1,230	43
15645	Joshua Dillon	do	Vilmorin	Oct. 20	14.80	11.90	11.30	80.2	15.0	2.445	599	21
15727	A. T. Birchard	do	Kleinwanzlebener	Oct. 22	15.70	11.80	11.20	74.9	17.0	2.567	370	13
16095	do	do	do	Nov. 9	16.00	11.80	11.20	73.8			705	25
16308	do	do	do	Nov. 9	17.00	13.10	12.50	77.2			865	31
16302	do	do	do	Nov. 9	17.60	14.50	13.80	82.6			635	22
16310	do	do	do	Nov. 9	18.70	15.50	14.70	82.8			360	13
16311	do	do	do	Nov. 9	17.00	13.10	12.40	76.9			605	21
16380	do	do	Vilmorin	Nov. 13	20.20	15.10	14.40	74.9			380	13
16381	do	do	do	Nov. 13	21.80	17.20	16.30	78.8			510	18
16346	do	do	Kleinwanzlebener	Nov. 23	19.00	13.30	12.60	77.8	20.3	4.704	510	18
15922	W. R. Haslet	do	do	Oct. 31	15.20	10.10	9.60	66.4			695	25
16046	Nathan Kirk	do	Kleinwanzlebener	Oct. 31	16.40	10.30	9.70	62.6	23.1	2.541	470	17
16048	Wm. J. Fort	do	do	Nov. 2	18.00	13.80	13.10	76.7	21.8	3.957	705	25
15977	Benj. E. Shirk	do	do	Oct. 29	19.40	15.40	14.60	79.0			465	16
	Average				16.10	12.15	11.54	75.1	16.93	2.872	595	21
15921	G. W. Moon	Mills		Oct. 22	14.42	11.25	10.69	78.0			1,375	49
16043	T. H. Moore	Manona	Kleinwanzlebener	Oct. 31	17.30	12.40	11.80	71.8			900	32
16044	W. S. Wade	do	do	Oct. 31	17.20	11.60	11.00	67.6			860	30
16045	C. E. Underhill	do	do	Oct. 31	15.50	10.50	10.00	68.0			855	30
16545	John Wilson	do	do	Nov. 23	12.90	9.10	8.60	70.1			600	21
	Average				15.73	10.90	10.35	69.4			804	28
15918	C. C. Pfalter	Montgomery	Vilmorin	Oct. 27	14.42	10.25	9.74	71.1			375	13
16090	Peter Erickson	do	do	Nov. 2	17.31	13.25	12.59	76.5			870	31
	Average				15.83	11.75	11.17	73.8			623	22
15070	Samuel Hallock	Muscatine	Fruch	Sept. 14	13.30	9.40	9.09	70.9			1,870	65
16379	do	do	German	Nov. 13	18.80	15.30	14.50	81.3			1,025	36

16044	S. V. Chenoweth	do	Sept. 17	15.20	12.10	11.50	79.2	-----	-----	890	32
16272	do	do	Oct. 10	17.10	14.10	13.50	83.7	-----	-----	565	20
16242	D. D. Webster	Kleinwanzlebener	Oct. 9	17.30	14.10	13.40	81.7	-----	-----	744	20
16139	do	do	Oct. 9	19.60	16.40	15.50	83.5	-----	-----	930	24
16165	J. A. Shwartz	Vilmorin	Oct. 23	17.40	13.50	12.80	77.7	-----	-----	930	33
16085	Chris Knudler	do	Nov. 2	18.30	14.20	13.40	77.3	19.3	3,618	390	21
16506	do	Kleinwanzlebener	Nov. 19	20.00	16.80	16.00	83.9	-----	-----	633	22
16507	do	Vilmorin	Nov. 19	21.00	17.30	16.40	82.0	-----	-----	700	25
16086	do	Kleinwanzlebener	Nov. 2	17.61	13.10	12.45	74.4	-----	-----	546	18
16503	W. H. Hoopes & Sons	do	Nov. 19	17.50	13.10	14.30	85.9	-----	-----	697	25
16504	do	Vilmorin	Nov. 19	16.10	12.20	11.50	75.3	-----	-----	745	26
16505	do	do	Nov. 19	15.50	11.40	10.80	73.4	-----	-----	850	30
16508	Mittman Bros.	do	Nov. 19	17.10	15.10	14.40	85.2	7.4	1,633	850	30
16509	do	do	Nov. 19	18.30	16.00	15.20	87.3	7.4	1,772	775	27
16510	H. R. Smull	do	Nov. 19	17.30	13.80	13.10	80.4	3.1	589	358	13
16511	M. D. Manlove	do	Nov. 19	18.00	15.60	14.80	86.5	-----	-----	930	33
16512	do	do	Nov. 19	17.00	14.30	13.60	84.0	-----	-----	520	18
16513	C. S. Bird	do	Nov. 19	20.10	17.10	16.20	88.4	-----	-----	415	15
16514	B. B. Rankin	do	Nov. 19	17.10	13.40	12.70	78.4	-----	-----	703	25
16515	Jake Wackerlin	do	Nov. 19	20.30	16.50	15.70	81.9	2.5	620	650	23
16516	do	Kleinwanzlebener	Nov. 19	20.00	16.20	15.40	81.2	3.9	896	555	20
16517	Henry Neumeier	do	Nov. 19	18.00	14.20	13.40	73.0	3.9	885	547	19
16518	do	Vilmorin	Nov. 19	18.30	15.00	14.30	81.8	-----	-----	900	32
16519	do	do	Nov. 19	18.20	15.40	14.60	85.0	-----	-----	650	23
16520	do	do	Nov. 30	18.30	16.20	15.40	88.8	-----	-----	1,142	40
16521	Elisha Beatty	do	Nov. 30	18.30	16.20	15.40	88.3	-----	-----	550	19
16522	do	do	Nov. 30	20.20	17.00	16.20	83.6	-----	-----	500	18
16523	G. H. Stiles	do	Nov. 30	20.20	18.40	17.40	90.2	-----	-----	440	16
16524	J. E. Hoopes & Co.	do	Nov. 30	20.20	18.40	17.40	90.2	-----	-----	550	19
16525	Average	-----	-----	18.04	14.85	14.10	81.69	6.78	1,430	722	26
16457	E. J. Brewster	Osceola	Nov. 16	16.50	12.70	12.00	76.8	21.1	3,515	535	19
16135	A. A. Atwood	Page	Nov. 3	13.40	9.30	8.80	68.5	-----	-----	1,240	44
15980	T. H. Jackson	Palo Alto	Oct. 29	19.50	15.90	15.10	81.4	17.9	2,394	1,010	36
15279	J. Wernli	Plymouth	Oct. 10	12.48	8.19	7.78	65.5	-----	-----	925	33
15280	do	do	Oct. 10	13.18	9.78	9.30	74.1	-----	-----	1,095	39
15423	James Smith	do	Oct. 15	12.55	8.82	8.38	70.0	-----	-----	1,330	47
16376	J. J. Madden	German	Nov. 13	16.35	11.85	11.26	72.5	-----	-----	925	33
16383	Henry Taylor	do	Nov. 13	15.25	11.25	10.69	73.8	-----	-----	605	21
16248	Robt. Maxwell	Kleinwanzlebener	Nov. 7	12.75	9.70	9.22	76.1	-----	-----	2,040	72
16639	Average	-----	-----	13.76	9.93	9.44	72.0	-----	-----	1,150	41
16639	Jos. Hawkins	Pochontas	-----	17.87	13.44	12.77	76.8	25.00	44.10	-----	-----
16640	do	do	-----	19.77	16.15	15.34	81.6	-----	-----	5.70	20
-----	Average	-----	-----	18.82	14.80	14.06	79.2	25.00	44.10	5.70	20

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
						Per ct.	Per ct.	Per ct.	Tons.	Pounds.	Grams.	Ounces.
15099	R. Wohlgenuth.....	Polk.....	Kleinwanzlebener.....	Sept. 25	11.48	6.89	6.54	60.0	16.3	1,157	1,055	37
15111	Mrs. J. A. Woods.....	do.....	Vilmorin Improved.....	Sept. 28	15.47	10.38	9.86	66.6	22.8	2,064	850	30
15724	do.....	do.....	do.....	Oct. 22	15.79	12.90	12.23	81.1	22.8	4,108	310	11
15440	Paul Fisher.....	do.....	French.....	Oct. 16	15.68	12.10	11.50	77.2	.....	.....	515	18
15450	do.....	do.....	Diamond.....	Oct. 16	16.08	12.40	11.78	77.1	.....	.....	610	22
15452	do.....	do.....	German.....	Oct. 16	15.59	12.75	12.11	81.9	21.6	3,866	370	13
15453	do.....	do.....	Kleinwanzlebener.....	Oct. 16	16.29	13.63	12.95	83.5	.....	.....	460	16
15454	do.....	do.....	Vilmorin.....	Oct. 16	16.79	13.93	13.23	82.9	.....	.....	485	17
15455	do.....	do.....	Lanes Imperial.....	Oct. 16	13.28	9.95	9.45	74.8	.....	.....	470	17
15731	Robt. Fullerton.....	do.....	Kleinwanzlebener.....	Oct. 22	15.08	11.20	10.64	74.1	.....	.....	165	23
15732	do.....	do.....	Vilmorin.....	Oct. 22	14.38	10.15	9.98	71.9	.....	.....	925	33
15920	J. B. Campbell.....	do.....	do.....	Oct. 27	16.74	12.85	11.75	73.7	.....	.....	770	27
	Average.....				15.22	11.58	11.00	75.4	20.9	2,799	624	23
15035	G. Rabbee.....	Pottawattamie.....	German.....	Sept. 15	12.95	9.54	9.06	73.7	.....	.....	4,840	171
15082	L. D. Cronmiett.....	Sac.....	Kleinwanzlebener.....	Sept. 24	12.84	9.17	8.71	71.4	20.9	2,345	2,300	81
15448	do.....	do.....	do.....	Oct. 16	15.88	11.48	10.91	72.3	.....	.....	1,565	55
	Average.....				14.36	10.33	9.81	71.9	20.9	2,345	1,933	68
15122	A. F. Schoening.....	Scott.....	Bultean Desprez.....	Sept. 29	21.59	16.59	15.76	76.3	.....	.....	510	18
15123	do.....	do.....	Vilmorin Improved.....	Sept. 29	17.89	14.43	13.70	80.6	.....	.....	545	19
15129	C. J. Barr.....	do.....	Bultean Desprez.....	Oct. 1	17.27	14.41	13.70	83.4	17.2	3,547	475	17
15130	do.....	do.....	Vilmorin Improved.....	Oct. 1	15.67	13.04	12.39	83.2	19.0	3,534	490	17
15216	do.....	do.....	Bultean Desprez.....	Oct. 8	14.18	10.26	9.73	72.3	13.0	1,647	1,100	39
15217	do.....	do.....	Vilmorin Improved.....	Oct. 8	14.98	11.43	10.86	70.0	11.0	1,507	685	22
15276	Leo Traeger.....	do.....	Kleinwanzlebener.....	Oct. 10	14.08	10.35	10.03	74.8	22.0	3,120	730	25
15277	do.....	do.....	Vilmorin.....	Oct. 10	17.69	13.45	12.84	76.0	.....	.....	720	25
15281	J. K. Pope.....	do.....	French.....	Oct. 10	15.08	11.10	10.54	73.5	.....	.....	930	33
15287	do.....	do.....	Kleinwanzlebener.....	Oct. 10	15.28	10.22	9.71	66.8	.....	.....	780	28
15422	J. R. Porter.....	do.....	Bultean Desprez.....	Oct. 15	14.67	12.20	11.58	71.9	8.66	83.0	1,840	65
15513	James Dyer.....	do.....	Lanes Imperial.....	Oct. 17	12.68	9.12	8.66	68.1	.....	.....	975	34
15725	E. J. Hilton.....	do.....	Vilmorin.....	Oct. 22	16.39	14.45	13.73	83.2	.....	.....	705	25
15974	B. H. Lage.....	do.....	Bultean Desprez.....	Oct. 29	14.23	9.00	8.55	68.1	.....	.....	675	24
15730	Joachim Guelzow.....	do.....	do.....	Oct. 29	17.19	13.25	12.59	77.1	20.9	3,662	1,225	43
15975	Fritz Jurgensen.....	do.....	do.....	Oct. 29	19.03	15.10	14.35	79.5	.....	.....	560	20
15978	Wm. Steinhoff.....	do.....	do.....	Oct. 29	16.23	12.70	12.07	78.3	.....	.....	1,100	39

16097	J. E. McConnell	do	Vilmorin Improved	Nov. 2	22.01	16.75	15.92	76.1	840	30
16134	B. T. Seaman	do	do	Nov. 3	18.55	14.35	13.63	77.3	965	34
16140	do	do	Bultean Desprez	Nov. 3	18.97	14.65	13.92	77.2	825	29
16532	do	do	Desprez No. 1, red	Nov. 10	17.49	14.00	13.30	80.0	3,590	18
16533	do	do	Desprez No. 2, white	Nov. 10	19.79	16.50	15.08	83.4	500	19
16138	Nick Sons	do	Vilmorin	Nov. 3	20.97	16.60	15.77	80.0	500	13
16293	Miles A. Collins	do	Bultean Desprez	Nov. 9	19.37	13.55	12.87	70.0	1,040	37
16295	do	do	Vilmorin	Nov. 9	20.67	14.65	13.92	70.9	1,170	41
16446	H. Seifers	do	Vilmorin	Nov. 16	17.37	13.60	12.92	78.3	1,090	39
16558	John H. Koehn	do	Kleinwanzlebener	Nov. 23	19.73	14.70	13.96	74.5	620	22
16249	John B. Kahoe	do	French, conical	Nov. 7	17.75	12.25	11.64	69.0	1,040	37
15239	Wm. Koss	do	Vilmorin	Nov. 2	17.03	12.88	12.23	75.0	93	3
16657	Geo. Kraft	do	Desprez	Dec. 21	17.54	14.00	13.29	80.7	1,530	54
16642	James McGee	do	Vilmorin	Dec. 21	16.25	12.35	11.73	76.0	820	29
	Average	do	do		17.34	13.29	12.63	76.3	2,944	29
15925	C. B. Irwin	Shelby	Kleinwanzlebener	Oct. 27	11.80	8.20	7.80	69.4	650	23
15311	J. W. Hill	Taylor	do	Oct. 12	14.08	10.28	9.77	73.0	840	30
15312	do	do	do	Oct. 12	15.08	8.71	8.28	57.7	720	25
	Average	do	do		14.58	9.50	9.03	65.4	780	28
15820	Aug. Millor	Union	French	Oct. 24	15.15	11.40	10.83	74.5	1,340	47
15821	do	do	Kleinwanzlebener	Oct. 24	14.65	10.10	9.60	69.0	1,065	38
	Average	do	do		14.90	10.75	10.22	71.8	1,203	43
15979	A. H. Morris	Van Buren	French	Oct. 29	18.50	15.10	14.35	81.5	280	10
16347	do	do	German	Nov. 11	17.30	13.00	12.35	75.2	1,274	4
	Average	do	do		17.90	14.05	13.35	78.4	2,142	7
15010	S. C. Baxtor	Wapello	German	Sept. 1	11.70	8.60	8.17	73.3	1,500	53
15343	S. J. Kador	do	do	Oct. 13	16.50	13.40	12.70	81.3	1,100	39
15577	John Strain	do	do	Oct. 19	13.80	9.60	9.10	70.0	980	35
15906	Austin Gray	do	French	Oct. 30	18.10	14.90	14.20	72.4	3,973	14
	Average	do	do		15.03	11.63	11.04	74.3	991	35
15817	L. A. Stevenson	Warren	Diamond	Oct. 24	14.75	10.00	9.50	67.1	727	26
16384	J. N. Brunson	Webster	Kleinwanzlebener	Nov. 13	17.20	14.10	13.4	82.0	450	16
16005	J. J. Taylor	Winnebago	do	Oct. 30	16.30	12.50	11.90	76.7	895	32
16475	J. J. Otis	do	Kleinwanzlebener	Nov. 17	19.60	14.60	13.80	74.3	1,270	45
	Average	do	do		17.95	13.55	12.85	75.5	1,083	39

15243	Andrew Leupold	Marshall	Kleinwanzlebener	Oct. 9	13.53	9.26	8.80	68.6		2,150	76
15244	do	do	Vilmorin	Oct. 9	12.43	7.84	7.43	63.2		1,830	65
	Average				12.98	8.55	8.12	65.9		1,990	71
15066	John G. Hosker	Mitchell	Kleinwanzlebener	Sept. 25	13.11	9.51	9.03	72.5		1,260	45
15134	T. J. West	do	Bulteau Desprez	Oct. 2	13.08	9.23	8.77	70.5		965	34
16364	C. S. Farnham	do	Kleinwanzlebener	Nov. 13	13.67	9.20	8.74	67.3		590	21
	Average				13.29	9.31	8.85	70.1		938	33
16156	J. W. Bronaugh	Nemaha	Kleinwanzlebener	Nov. 3	16.37	12.65	12.01	77.3		690	21
15108	Peter Balliet	Ness	Bulteau Desprez	Sept. 28	18.07	11.66	11.08	64.7	15.7	2,023	13
15049	Paul Haller	Rawlins	do	Sept. 19	19.93	16.42	15.60	82.4	11.76	2,728	20
15188	C. H. Wagler	Reno	Kleinwanzlebener	Oct. 6	14.85	10.24	9.73	69.0	23	2,788	22
15128	John F. Miller	Rooks	Vilmorin Improved	Oct. 1	17.15	12.27	11.66	71.5	13	1,955	15
15426	do	do	do	Oct. 15	15.15	9.16	8.70	60.9		585	21
	Average				16.15	10.72	10.18	66.2	13	1,955	18
16105	Ed. Lotz	Saline	Kleinwanzlebener	Nov. 2	16.29	9.20	8.74	56.6		580	20
16106	do	do	do	Nov. 2	16.59	11.50	10.93	63.4		1,190	42
16107	do	do	do	Nov. 2	13.35	13.35	12.58	63.9		620	22
16108	do	do	do	Nov. 2	19.11	11.80	11.21	68.2		990	35
16109	do	do	do	Nov. 2	17.29	9.00	8.55	58.9		950	34
16110	do	do	do	Nov. 2	15.29	8.30	7.89	54.3		1,420	52
16111	do	do	do	Nov. 2	18.81	12.50	11.87	66.5		790	28
16112	do	do	do	Nov. 2	12.80	12.16	12.16	68.1		890	31
16113	do	do	do	Nov. 2	16.99	8.65	8.22	50.9		900	32
16114	do	do	do	Nov. 2	17.29	11.50	10.93	66.5		590	21
16115	do	do	do	Nov. 2	17.19	11.05	10.50	64.3		940	31
16116	do	do	do	Nov. 2	19.01	13.35	12.58	70.2		620	22
	Average				17.33	11.08	10.51	63.7		873	31
16026	A. M. Simmonds	Smith	Kleinwanzlebener	Oct. 30	12.28	8.00	7.6	65.1		2,080	73
	Average of State				16.45	11.25	10.69	68.2	16.17	2,387	33

Summary of results by States and counties—Continued.

KENTUCKY.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
16031	T. S. Moberley	Madison	.....	Oct. 31	11.14	Per ct. 6.00	Per ct. 5.70	52.6	Tons.	.....	1,465	52
16481	C. A. Purdy	Pendleton	French	Nov. 18	16.77	11.75	11.16	70.1	.....	.....	547	19
16482	.....do	.....do	German	Nov. 18	16.17	11.05	10.50	68.3	.....	.....	876	31
	Average	.....	.....	.....	16.47	11.40	10.83	69.2	.....	.....	712	25
	Average of State	.....	.....	.....	14.69	9.60	9.12	63.7	.....	.....	963	34

MARYLAND.

16337	H. D. Alvord	Prince George	Vilmorin	Dec. 7	11.82	8.90	8.45	75.3	.....	.....	370	13
16338	.....do	.....do	Lanes	Dec. 7	10.70	6.60	6.27	61.7	.....	.....	530	19
	Average	.....	.....	.....	11.26	7.75	7.36	68.5	.....	.....	450	15

MICHIGAN.

16252	J. R. Dibble	Allegan	German	Nov. 6	15.53	11.60	11.02	74.5	.....	.....	619	23
16552	R. A. Schuh	.....do	.....do	Nov. 23	22.94	19.25	18.29	83.9	.....	.....	650	24
16553	.....do	.....do	.....do	Nov. 23	23.84	20.75	19.71	88.9	.....	.....	415	15
	Average	.....	.....	.....	20.62	17.20	16.34	82.4	.....	.....	568	20
15744	Leonard C. Roach	Barry	Bultean Desprez	Oct. 22	13.31	10.25	9.74	72.5	.....	.....	1,520	54
16154	R. A. Polley	.....do	.....do	Nov. 3	16.35	11.70	11.12	71.5	.....	.....	900	22
16479	E. L. Hursley	.....do	.....do	Nov. 16	15.95	12.07	11.45	75.5	.....	.....	950	34
	Average	.....	.....	.....	15.20	11.34	10.77	73.2	.....	.....	1,123	40
16260	T. H. McGraw	Bay	Lane's Imperial	Nov. 7	12.95	9.50	9.05	73.4	.....	.....	825	29
16595	.....do	.....do	Vilmorin	Nov. 29	23.59	18.25	17.33	77.3	.....	.....	5,109	17
	Average	.....	.....	.....	18.27	13.88	13.19	75.4	.....	.....	5,109	23

16425	M. Coneight	Calhoun	Nov. 16	17.63	14.25	13.54	80.8	.....	.....	1,145	40
15085	George Duranco	Charlevoix	Sept. 24	14.94	11.86	11.26	79.5	.....	.....	1,670	50
16023	do	do	Oct. 30	15.58	11.30	10.74	72.4	.....	.....	1,095	39
	Average			15.26	11.58	11.00	76.0	.....	.....	1,383	49
16050	S. R. Fuller	Eaton	Dec. 21	16.85	12.21	11.60	72.5	24.4	2,704	840	20
16052	do	do	Dec. 21	17.67	14.01	13.30	79.3	21.8	4,146	600	21
	Average			17.26	13.11	12.45	75.9	23.1	3,425	720	26
16273	C. W. Frazer	Grand Traverse	Nov. 9	19.17	15.65	14.87	77.6	.....	.....	540	19
16274	do	do	Nov. 9	16.17	12.85	12.21	79.5	.....	.....	735	26
	Average			17.67	14.25	13.54	78.6	.....	.....	638	23
15782	H. L. Francisco	Gratiot	Oct. 23	16.87	13.75	13.06	81.5	20.4	3,917	360	13
16277	do	do	Nov. 9	20.27	17.90	17.01	88.3	20.4	5,530	470	17
16280	H. Brady	do	Nov. 9	17.27	14.40	13.68	83.4	13.5	2,781	990	35
16281	do	do	Nov. 9	17.27	14.40	13.68	83.4	10.7	2,204	430	15
	Average			17.92	15.11	14.36	84.2	16.3	3,608	563	20
15471	William H. Clay	Hillsdale	Oct. 16	15.58	11.08	10.53	71.1	.....	.....	840	30
15412	Henry J. Wright	do	Oct. 15	15.15	11.53	11.01	76.5	.....	.....	1,160	41
16467	J. F. Fogg	do	Nov. 16	18.37	15.50	14.72	84.4	.....	.....	390	14
16651	Lovell Bros	do	Dec. 21	17.87	14.09	13.38	78.8	.....	.....	1,095	39
	Average			16.74	13.07	12.41	77.7	.....	.....	871	31
16408	J. W. Hicks	Jackson	Nov. 14	16.87	14.20	13.49	84.2	.....	.....	1,420	50
16469	W. J. Cavanaugh	do	Nov. 14	18.17	15.00	14.25	82.6	.....	.....	355	13
	Average			17.52	14.60	13.87	83.4	.....	.....	888	32
15325	Charles E. Somer	Lapeer	Oct. 12	17.28	12.92	12.27	74.8	.....	.....	680	24
15326	do	do	Oct. 12	18.09	13.31	12.65	73.6	.....	.....	630	22
	Average			17.69	13.12	12.46	74.2	.....	.....	655	23
16278	John Irwin	Manistee	Nov. 9	16.17	12.50	11.88	77.3	.....	.....	1,480	52
16279	do	do	Nov. 9	17.67	14.00	13.30	79.2	.....	.....	1,210	43
16387	Josiah Hillard	do	Nov. 13	16.25	12.25	11.64	75.4	.....	.....	1,240	44
	Average			16.69	12.92	12.27	77.3	.....	.....	1,310	46
16655	Christ Butzer	Muskegon	Dec. 7	18.24	15.75	14.97	86.3	.....	.....	805	29
16658	Jacob E. Stobbe	do	Dec. 21	15.57	11.30	10.74	72.7	.....	.....	1,100	39
	Average			16.89	13.53	12.86	79.5	.....	.....	953	34

Summary of results by States and counties—Continued.

MICHIGAN—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
						Per ct.	Per ct.	Per ct.	Tons.	Pounds.	Grams.	Ounces.
15647	Marcus Wightman.....	Newaygo.....	Vilmorin.....	Oct. 20	16.09	13.00	12.35	80.8	.....	.....	387	14
16022	Wm. H. Barry.....	Oceana.....	Vilmorin Improved.....	Oct. 30	17.89	14.00	13.31	78.2	.....	.....	625	22
16649	do.....	do.....	do.....	Dec. 21	16.67	13.77	13.08	82.5	11.87	2,312	480	17
	Average.....				17.28	13.89	13.20	80.4	11.87	2,312	553	20
15469	Jno. Witt.....	Oscoda.....	German.....	Oct. 16	18.99	16.45	15.63	86.6	.....	.....	890	31
15470	do.....	do.....	French.....	Oct. 16	18.89	15.97	15.17	84.6	.....	.....	520	18
	Average.....				18.94	16.21	15.40	85.6	.....	.....	705	25
16110	Jacob Barense.....	Ottawa.....	German.....	Nov. 14	13.75	11.10	10.55	80.7	.....	.....	800	28
16411	Jno. Leeshouts.....	do.....	do.....	Nov. 14	13.17	16.15	15.34	84.2	.....	.....	880	31
16441	Geo. Ohlmann.....	do.....	Silesian.....	Nov. 16	17.53	13.35	12.68	76.2	.....	.....	840	30
16442	do.....	do.....	Vilmorin.....	Nov. 16	13.63	8.45	8.03	63.5	.....	.....	660	23
	Average.....				16.02	12.26	11.65	76.2	.....	.....	795	28
16172	Terre Becker.....	Saginaw.....	Kleinwanzlebener.....	Nov. 4	14.82	11.50	10.93	77.6	.....	.....	1,970	70
16173	H. M. Youmans.....	do.....	do.....	Nov. 4	20.04	16.50	15.67	82.6	.....	.....	1,240	44
16174	S. H. Webster.....	do.....	do.....	Nov. 4	12.52	8.05	7.65	64.3	.....	.....	2,060	73
	Average.....				15.79	12.02	11.42	74.8	.....	.....	1,757	62
15983	Wm. W. Teal.....	St. Joseph.....	Vilmorin.....	Oct. 20	15.53	11.30	10.73	72.8	.....	.....	1,273	45
15362	Michael Gates.....	Van Buren.....	French.....	Oct. 13	11.42	8.49	8.06	74.5	17.4	1,921	565	20
15939	do.....	do.....	do.....	Oct. 27	16.64	12.45	11.83	74.8	16.6	2,049	705	27
15960	Jas. G. Rabbitt.....	do.....	do.....	Oct. 28	14.75	11.40	10.83	71.3	.....	.....	1,015	36
16468	J. P. Bewley.....	do.....	French.....	Nov. 16	15.15	11.35	10.78	74.9	.....	.....	1,570	55
16469	do.....	do.....	German.....	Nov. 16	17.37	12.50	11.88	72.0	.....	.....	1,120	40
	Average.....				15.07	11.24	10.68	74.7	17.0	2,285	1,007	36
	Average of State.....				16.91	13.31	12.64	78.0	17.20	3,444	906	32

MINNESOTA.

16362	Jno. Hunter.....	Anoka.....	French.....	Nov. 13	18.99	15.00	14.25	79.0			445	16
15932	Fred. Koenig.....	Brown.....	Vilmorin Improved.....	Oct. 27	16.22	11.35	10.79	70.0			740	26
15933	do.....	do.....	Kleinwanzlebener.....	Oct. 27	13.82	9.25	8.79	67.0			1,300	46
	Average.....				15.02	10.30	9.79	68.5			1,020	36
16451	Narve Narvesen.....	Clay.....		Nov. 16	13.35	9.05	8.60	67.8			1,690	60
15931	J. G. Cook.....	Dakota.....	Vilmorin Improved.....	Oct. 27	16.14	12.50	11.88	77.4			590	21
16433	Gao. W. Dong.....	Faribault.....	White.....	Nov. 16	17.23	12.65	12.02	73.4			810	29
16434	W. Z. Haight.....	do.....	do.....	Nov. 16	16.43	12.45	11.83	75.8			1,045	37
16435	do.....	do.....	do.....	Nov. 16	16.53	13.00	12.35	78.6			685	24
16592	Wm. Waldren, Jr.....	do.....	Kleinwanzlebener.....	Nov. 29	19.17	14.20	13.49	74.0			520	18
	Average.....				17.34	13.08	12.42	75.5	7	1,260	765	27
15214	Ed. Dagen.....	Fillmore.....	Kleinwanzlebener.....	Oct. 8	17.08	13.48	12.81	79.2	10	1,870	490	17
15215	do.....	do.....	Vilmorin.....	Oct. 8	16.68	11.76	11.17	70.6	11	1,566	560	20
	Average.....				16.88	12.62	11.99	74.9	10.5	1,718	525	19
16436	A. F. Neil.....	Goodhue.....	French.....	Nov. 16	21.03	16.20	15.39	77.0			700	25
16437	do.....	do.....	German.....	Nov. 16	18.13	14.15	13.44	78.0	21.8	4,125	565	20
16465	J. C. Dickey.....	do.....	do.....	Nov. 16	18.17	15.30	14.54	84.2	21.8	4,820	530	19
16466	do.....	do.....	French.....	Nov. 16	20.27	17.50	16.63	86.3	17.4	4,505	415	15
	Average.....				19.40	15.79	15.00	81.4	20.3	4,483	553	20
16604	C. Benjamin.....	Hennepin.....	Vilmorin.....	Nov. 30	17.33	14.20	13.49	80.4			1,040	37
16605	do.....	do.....	Kleinwanzlebener.....	Nov. 30	17.73	13.85	12.69	77.9			900	32
	Average.....				17.53	13.78	13.09	79.2			970	35
16439	Wm. H. Hatch.....	Linn.....	French.....	Nov. 16	12.63	8.00	7.60	63.4			2,085	74
16440	do.....	do.....	do.....	Nov. 16	15.53	10.60	10.07	68.3			1,000	35
	Average.....				14.08	9.30	8.84	65.9			1,543	55
15062	Wm. Katheman.....	McLeod.....	Kleinwanzlebener.....	Sept. 21	16.05	11.40	10.83	71.1			1,330	47
10380	J. Eisenlohr.....	Martin.....	French.....	Nov. 10	13.67	9.55	9.07	69.9			1,650	58
15013	J. T. Rutherford.....	Mower.....	French.....	Sept. 6	18.98	15.92	15.12	86.8			655	23
15109	do.....	do.....	do.....	Sept. 28	17.47	11.65	11.05	66.5			840	30
16629	A. F. Wagner.....	do.....	German.....	Dec. 7	18.44	15.05	14.30	81.6			490	17
16630	Benj. Wright.....	do.....	French.....	Dec. 7	20.64	15.90	15.10	77.0	30		430	15

MISSOURI.

16206	S. Goodson.....	Adair.....	French.....	Nov. 5	16.33	12.00	11.41	73.4	2,055	73
16231	Scott Spencer.....	do.....	do.....	Nov. 10	16.67	11.00	10.45	66.0	665	23
16232	A. J. Garlock.....	do.....	German.....	Nov. 10	14.97	11.35	10.78	75.8	1,000	35
16252	do.....	do.....	French.....	Nov. 11	17.79	13.30	12.64	74.8	1,870	66
16253	do.....	do.....	do.....	Jan. 22	16.37	10.18	9.68	62.2	530	19
16283	John Patterson.....	do.....	do.....	Jan. 22	16.37	11.71	11.13	61.1	366	13
16286	do.....	do.....	Vilmorin.....	Jan. 22	15.37	8.94	8.50	58.2	550	19
16087	do.....	do.....	do.....	Jan. 22	15.37	8.94	8.50	58.2	550	19
	Average.....				16.67	11.21	10.66	67.4	1,005	35
16698	Thos. P. Withers.....	Barry.....	French.....	Jan. 22	15.33	10.12	9.62	66.0	493	17
16681	J. J. Conrad.....	Bollinger.....	French.....	Jan. 22	21.80	10.61	10.08	48.7	182	6
16718	Mo. Agr. Station.....	Boone.....	White Silesian.....	Jan. 22	14.33	7.29	6.93	50.9	470	17
16719	do.....	do.....	Wohanka.....	Jan. 22	14.23	10.28	9.77	72.4	383	14
16720	do.....	do.....	French.....	Jan. 22	16.33	9.64	9.16	59.6	490	17
16721	do.....	do.....	Simon-Legrand.....	Jan. 22	17.73	13.05	12.40	73.6	315	11
16722	do.....	do.....	Vilmorin.....	Jan. 22	19.63	13.44	12.77	68.5	476	17
16723	do.....	do.....	Kleinwanzlebener.....	Jan. 22	19.53	11.64	11.06	59.6	270	10
16724	do.....	do.....	Florimond Desprez.....	Jan. 22	18.03	12.62	11.99	70.0	270	10
	Average.....				17.12	11.14	10.58	64.9	401	14
16694*	Frank W. Arms.....	Caldwell.....	Vilmorin.....	Jan. 22	22.44	15.79	15.01	70.4	310	11
16695*	do.....	do.....	French.....	Jan. 22	21.54	17.91	17.02	83.1	283	10
16696*	do.....	do.....	Wohanka.....	Jan. 22	22.44	16.47	15.65	73.4	343	12
16697*	do.....	do.....	White Silesian.....	Jan. 22	21.94	14.67	13.94	66.9	457	16
	Average.....				22.09	16.21	15.41	73.5	348	12
16702*	Dr. D. H. Webster.....	Cass.....	Vilmorin.....	Jan. 22	18.33	11.87	11.28	64.8	332	11
16703*	do.....	do.....	French.....	Jan. 22	18.03	12.63	11.47	66.7	207	7
	Average.....				18.18	11.95	11.38	65.8	265	9
16673*	Geo. S. Wilson.....	Dade.....	French.....	Jan. 22	17.60	9.13	8.68	51.9	420	15
16674*	do.....	do.....	Wohanka.....	Jan. 22	15.60	6.51	6.19	41.7	486	17
16675*	do.....	do.....	Vilmorin.....	Jan. 22	15.30	6.45	6.13	42.2	387	14
16676*	do.....	do.....	White Silesian.....	Jan. 22	17.80	9.10	8.65	51.1	310	11
	Average.....				16.58	7.80	7.41	46.7	401	14
16688*	W. H. Hickman.....	Davies.....	Wohanka.....	Jan. 22	19.77	12.47	11.87	63.2	710	25
16689*	do.....	do.....	Vilmorin.....	Jan. 22	20.07	13.25	12.59	66.0	665	23
	Average.....				19.92	12.86	12.23	64.6	688	24

* Sent by State agricultural station.

MISSOURI—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.
						Juice.	Beet.				
16715*	Jos. Kirchgraber	Greene.	Wohanka.	Jan. 22	18.33	Per ct. 11.27	Per ct. 10.71	Per ct. 61.5	Tons.	Pounds.	Grams.
16716*	do.	do.	French.	Jan. 22	18.83	6.80	6.46	36.1	499	499	17
16717*	do.	do.	Wohanka.	Jan. 22	13.53	7.64	7.26	56.5	23	659	23
	Average.				16.90	8.57	8.14	51.4			538
16700*	C. H. Hartsook.	Henry.	Vilmorin.	Jan. 22	14.73	9.99	9.50	67.8			423
16701*	do.	do.	French.	Jan. 22	17.27	10.36	9.85	60.0			376
	Average.				16.00	10.18	9.68	63.9			400
16707*	Col. J. C. Evans.	Jackson.		Jan. 22	18.83	.....	.....	.....			500
16708*	do.	do.		Jan. 22	17.43	14.97	14.23	85.8			533
16709*	do.	do.		Jan. 22	18.63	10.80	10.35	58.5			1,060
16710*	do.	do.		Jan. 22	16.33	10.52	10.00	64.4			1,920
	Average.				17.81	12.13	11.53	69.6			928
16690*	Jas. Shouse.	Knox.	Wohanka.	Jan. 22	19.27	13.34	12.68	69.2			182
16691*	do.	do.	French.	Jan. 22	19.87	14.93	14.19	75.1			200
16692*	do.	do.	Vilmorin.	Jan. 22	19.00	11.29	10.73	59.4			385
16693*	do.	do.	White Slesian.	Jan. 22	22.94	16.67	15.84	72.7			290
	Average.				20.27	14.06	13.36	69.1			242
16562	Melchior Rehg.	Lafayette.	White Slesian.	Nov. 24	15.63	11.75	11.16	75.3			460
16706	Teubner Aull.	do.	French.	Jan. 22	20.23	13.20	12.34	65.2			365
	Average.				17.93	12.48	11.75	70.3			413
15745	Aug. Glesser	Lewis.	Vilmorin.	Oct. 22	16.80	13.50	12.82	80.0			665
16439	Wm. H. Hatch.	Linn.	French.	Nov. 16	12.63	8.00	7.60	63.4			2,085
16440	do.	do.	do.	Nov. 16	15.53	10.60	10.07	68.3			1,000
	Average.				14.08	9.30	8.84	65.9			1,543
15034	Albert Vnohris	Livingston.		Sept. 15	16.37	12.59	11.96	76.9			1,800
											64

15116	Andreas Bestgen	Morgan	German	7.58	58.4	26	2,080	515	18
15120	do	do	French	9.26	66.9	24	2,688	360	13
	Average			8.42	62.7	25	2,384	438	16
16670*	G. W. Waters	Ralls	French	3.82	31.6			308	11
16771*	do	do	White Silesian	2.14	24.3			380	13
	Average			2.98	28.0			344	12
16677*	F. A. Scott	Randolph	French	7.77	46.5			783	28
16678*	do	do	Wohanka	8.13	48.1			566	20
16679*	do	do	White Silesian	8.97	49.0			823	29
16680*	do	do	Imperial	7.51	41.1			696	25
	Average			8.10	46.2			717	26
16699*	R. W. Mueller	St. Charles	French	11.98	67.2			1,350	48
16682*	Wm. Muir	St. Louis	French	9.23	52.1			178	6
16683*	do	do	Vilmorin	10.76	68.7			216	8
16684*	do	do	Wohanka	12.81	68.2			152	5
	Average			10.93	63.0			182	6
15555	Chas. E. Volton	Shelby	Vilmorin	11.25	75.3	16.3	2,368	430	15
16672	J. G. Buckhardt	do	White Silesian	12.60	60.9			360	13
	Average			11.93	68.1	16.3	2,368	395	14
16704*	J. H. Logan & Sons	Vernon	Wohanka	12.80	68.6			623	22
16705*	do	do	do	14.54	70.8			386	14
	Average			13.67	69.7			575	18
16711*	Fred. L. Jabin	Warren	White Silesian	11.34	63.4			235	8
16712*	do	do	Vilmorin	11.18	62.0			263	9
16713*	do	do	Wohanka	10.60	58.8			230	8
16714*	do	do	French	10.62	57.9			506	18
	Average			10.94	60.5			309	11
	Average of State			11.01	62.4	22.1	2,379	573	20

* Sent by State agricultural station.

MONTANA.

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Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
15384	M. Kercher	Custer	French	Oct. 14	14.65	Per ct. 10.69	Per ct. 10.15	Per ct. 73.0	Tons 16.0	2,141	737	26
15692	Chas. L. McKay	do	do	Oct. 21	13.41	9.95	9.45	74.2	.....	.....	1,005	27
15738	Wm. Strong	do	do	Oct. 22	13.48	9.65	9.16	71.5	.....	.....	2,300	81
15740	do	do	Golden Tankara	Oct. 22	11.08	8.50	8.07	72.9	.....	.....	1,600	39
16175	Wm. B. S. Higgins	do	French	Nov. 4	13.32	8.15	7.75	61.2	.....	.....	1,410	50
16176	do	do	do	Nov. 4	16.52	11.85	11.25	72.4	.....	.....	690	24
	Average				13.84	9.80	9.31	70.9	16.0	2,141	1,300	46
15089	Theodore J. Lynde	Gallatin	Kleinwanzlebener	Sept. 24	18.06	15.18	14.42	84.0	.....	.....	360	13
15090	do	do	do	Sept. 24	18.46	13.88	13.19	75.1	.....	.....	450	16
15366	do	do	do	Oct. 13	16.12	12.19	11.57	75.7	.....	.....	420	15
16200	do	do	do	Nov. 5	16.13	12.10	11.50	74.9	.....	.....	430	15
15607	Ella B. Lynde	do	do	Oct. 19	16.27	13.15	12.48	80.7	17.2	2,673	255	9
15608	do	do	do	Oct. 19	16.67	13.45	12.78	80.8	18.3	3,303	225	8
15609	C. H. Waterman	do	German	Oct. 19	16.77	13.00	12.55	77.4	.....	.....	625	22
15610	Wm. W. Wyle	do	do	Oct. 19	14.25	9.70	9.28	67.6	.....	.....	680	24
15630	Jno. W. Williams	do	Kleinwanzlebener	Oct. 24	19.67	14.40	13.08	73.2	.....	.....	1,400	15
15833	M. V. Huffman	do	do	Oct. 24	17.27	14.00	13.30	81.0	.....	.....	1,040	37
15834	Wm. F. Rea	do	do	Oct. 24	15.95	11.50	10.93	71.8	.....	.....	1,460	16
15906	Mary A. Black	do	Kleinwanzlebener	Oct. 26	18.37	14.10	13.40	76.7	17.2	3,191	475	17
15907	do	do	do	Oct. 31	19.67	15.90	15.11	80.8	.....	.....	530	19
16057	John L. Wortman	do	do	Nov. 2	19.47	16.00	15.20	82.2	.....	.....	400	14
16059	Samuel Hobbs	do	do	Nov. 2	19.01	13.75	13.06	70.1	.....	.....	770	27
16117	Wm. Blum	do	do	Nov. 2	17.61	13.60	12.92	71.5	.....	.....	490	17
16118	Theo. Norman	do	do	Nov. 2	18.01	13.50	12.83	75.0	.....	.....	920	33
16119	Jno. B. Bean	do	do	Nov. 3	18.01	13.50	12.83	75.0	.....	.....	425	15
16149	Thomas J. Lemon.	do	do	Nov. 3	19.67	16.00	15.20	81.4	15.5	3,403	480	17
16150	James H. Lemon.	do	do	Nov. 3	19.67	16.30	15.49	82.9	17.6	4,080	830	29
16151	J. D. Jones	do	do	Nov. 3	19.67	15.60	14.82	79.8	20.0	4,270	210	7
16201	Alphonse Bodgely	do	do	Nov. 5	21.27	16.50	15.08	77.6	.....	.....	340	12
16202	J. A. McElroy	do	do	Nov. 5	19.47	13.15	14.49	77.8	25.0	5,050	610	222
16245	Henry O. Gant	do	do	Nov. 7	18.77	13.50	14.73	78.4	22.9	4,772	330	8
16318	Lewis Lay	do	do	Nov. 10	19.17	16.20	15.39	84.5	12.9	3,028	230	8
16319	Geo. Comfort	do	do	Nov. 10	21.07	18.50	17.58	87.8	.....	.....	320	11
16529	Hugh C. McElroy	do	do	Nov. 20	19.97	15.60	14.33	78.1	25.0	5,215	750	26
16590	Joseph A. Pease	do	do	Nov. 29	23.67	18.20	17.28	76.9	.....	.....	470	17
15427	J. H. Nixon	do	do	Oct. 15	14.45	9.94	9.44	69.0	.....	.....	.....	.....

16058	Manhattan Malting Co. ....	.....do	French	Oct. 31	20.47	17.15	16.39	83.3	20.0	4,898	830	29
	Average .....	.....do .....	.....do .....	.....do	18.54	14.48	13.75	77.6	19.0	3,888	559	20
15739	Quang, Hing & Co	Lewis and Clarke	Kleinwanzlebener	Oct. 22	19.39	15.80	15.01	81.5	3.8	839	650	23
15741	.....do .....	.....do	Vilmorin Improved	Oct. 22	20.09	16.75	15.91	83.4	3.8	909	410	14
	Average .....	.....do .....	.....do .....	.....do	19.74	16.28	15.46	82.5	3.8	874	530	19
15832	Ray F. Moon	Missoula	Vilmorin	Oct. 24	21.67	16.80	15.96	77.5	.....	.....	930	23
15835	.....do .....	.....do	Kleinwanzlebener	Oct. 24	20.77	16.50	15.67	79.9	24.0	5,126	640	23
	Average .....	.....do .....	.....do .....	.....do	21.22	16.65	15.82	78.7	24.0	5,126	785	28
15691	Geo. H. Casey	Silver Bow	Kleinwanzlebener	Oct. 21	16.61	12.10	11.50	72.9	22.2	3,357	470	17
	Average of State .....	.....do .....	.....do .....	.....do	17.99	13.93	13.23	76.8	17.6	3,495	675	25

NEBRASKA.

15505	Herman Th. Glampe	Antelope	Kleinwanzlebener	Oct. 17	14.88	11.75	11.16	79.0	.....	.....	685	24
15507	.....do .....	.....do	Vilmorin	Oct. 17	15.29	12.29	11.68	80.4	.....	.....	725	26
	Average .....	.....do .....	.....do .....	.....do	15.09	12.02	11.42	79.7	.....	.....	705	25
15508	Wm. F. Reed	Blaine .....	.....do	Oct. 17	15.08	11.89	11.30	78.8	.....	.....	1,550	55
15509	.....do .....	.....do .....	.....do	Oct. 17	10.08	6.38	6.25	61.6	.....	.....	1,810	64
16624	E. C. Carter .....	.....do	French	Dec. 7	17.74	14.90	14.15	84.0	.....	.....	835	.....
	Average .....	.....do .....	.....do .....	.....do	14.50	11.12	10.57	74.8	.....	.....	1,398	60
16170	A. W. Clivish	Boxbutte	French	Nov. 4	22.04	18.00	17.10	81.7	.....	.....	880	31
16171	.....do .....	.....do	German	Nov. 4	20.44	16.15	15.34	79.0	.....	.....	860	30
	Average .....	.....do .....	.....do .....	.....do	21.24	17.08	16.22	80.4	.....	.....	870	31
16229	A. A. Hotchins	Chase	French	Nov. 6	20.89	16.30	15.49	78.0	.....	.....	1,710	60
16199	Mark W. Bailey .....	.....do	Kleinwanzlebener	Nov. 5	17.57	12.80	12.15	72.8	.....	.....	615	22
16625	L. C. Yronum .....	.....do	French	Dec. 7	19.54	16.00	15.20	81.3	.....	.....	360	13
16626	.....do .....	.....do	Desprez	Dec. 7	18.74	15.90	15.10	84.9	.....	.....	340	12
	Average .....	.....do .....	.....do .....	.....do	19.19	15.25	14.49	79.3	.....	.....	756	41
16591	L. Haumont	Custer	Kleinwanzlebener	Nov. 29	17.67	13.80	13.11	78.1	.....	.....	660	23
16693	.....do .....	.....do .....	.....do	Oct. 21	16.63	13.00	12.35	79.1	.....	.....	575	20
16169	M. W. Snyder .....	.....do	Vilmorin Improved	Nov. 4	17.22	11.20	10.65	65.0	.....	.....	735	26
16237	Jos. Jelinek .....	.....do	French	Nov. 9	13.35	11.50	10.93	74.9	.....	.....	1,000	35

NEBRASKA—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
16298	Jos. Jelinek	Custer	German	Nov. 9	15.65	Per ct. 11.50	Per ct. 73.5	73.5	17.9	2,911	1,180	42
16417	Henry Grantman	do	Vilmorin Improved	Nov. 14	19.07	13.50	12.83	70.8	17.9	2,911	1,270	45
	Average				16.90	12.42	11.80	73.6	14.8	2,634	903	32
15016	C. A. Elfsredt	Dawson	White	Sept. 8	15.31	11.91	11.31	77.9			480	15
16167	T. G. Fickensher	do	Bultean Desprez	Sept. 4	12.82	8.25	7.84	64.4			1,665	59
16168	do	do	Kleinwanzlebener	Nov. 4	14.42	10.01	9.50	70.0			1,410	50
	Average				14.18	10.06	9.55	70.8			1,168	41
15051	Geo. Kernetz	Dodge		Sept. 19	12.11	10.58	10.05	87.4			1,240	44
15895	do	do		Oct. 26	17.37	13.00	12.35	74.8			1,000	33
	Average				14.74	11.79	11.20	81.1			1,120	40
16390	Anton Krause	Fillmore		Nov. 12	13.35	9.80	9.31	73.4			2,220	79
15425	A. J. Cole	Furnas	Vilmorin	Oct. 15	12.15	8.40	7.98	68.8			1,380	49
15475	do	do	do	Oct. 16	15.08	8.89	8.45	58.9			1,685	59
15646	H. Montgomery	do	do	Oct. 20	16.09	13.00	12.35	80.8			387	14
15656	Peter Frölzer	do	German	Oct. 28	16.65	12.00	11.45	72.1			1,310	46
15957	do	do	French	Oct. 28	15.45	10.65	10.02	69.0			1,420	50
	Average				15.08	10.59	10.05	69.9			1,236	41
15365	K. A. Schmidt	Gage	Vilmorin Improved	Oct. 13	13.92	10.55	10.02	75.3			900	34
16049	C. F. Klein	Harlan	Vilmorin	Oct. 31	13.85	8.80	8.36	64.3			1,640	53
16050	do	do	do	Oct. 31	13.65	11.40	10.83	75.4			1,480	52
	Average				14.75	10.10	9.60	69.9			1,500	52
15893	James Grant	Howard		Oct. 26	18.17	14.85	14.12	81.7			890	29
15894	do	do		Oct. 26	18.47	15.70	14.95	85.0			510	18
	Average				18.32	15.28	14.54	83.4			670	24
15029	Martin Black	Jefferson	Kleinwanzlebener	Sept. 14	10.79	6.05	5.75	56.0			1,850	65

15043	D. Douglas	Johnson	Bulteau Desprez	Sept. 17	15.81	12.83	12.19	81.1				1,880	66
15317	F. J. Kingsbury	Keva Paha	Kleinwanzlebener	Oct. 12	14.28	10.20	9.69	71.4		898		660	23
15319	do	do	Vilmorin Improved	Oct. 12	14.58	11.54	11.54	83.3	7.2	1,076		300	11
15339	S. H. Chalker	do	German	Oct. 24	19.77	16.25	15.44	82.2	6.2			790	28
	Average				16.21	12.87	12.22	79.0	6.7	987		583	21
15318	Harvey S. Norton	Knox	Bulteau Desprez	Oct. 12	16.58	10.92	10.37	65.9				535	19
15947	Daniel Tenney	do	Kleinwanzlebener	Oct. 27	22.17	17.30	16.43	78.0				495	17
	Average				19.38	14.11	13.40	72.0				515	18
15073	J. H. Hassinger	Logan	Vilmorin Improved	Sept. 22	17.63	13.93	13.23	79.0	7.61	1,435		820	29
16391	J. L. Ritchey	Madison	French	Nov. 13	14.15	11.25	10.69	79.5	19.6	3,007		555	20
15042	M. L. Herrington	Pawnee	do	Sept. 17	12.82	8.37	7.95	67.9				1,540	54
15075	Wm. Taylor	Phelps	German	Sept. 23	14.51	10.91	10.36	75.2				1,680	59
15946	do	do	French	Oct. 28	16.25	12.90	12.25	79.4				735	26
15294	David L. Jones	do	Vilmorin Improved	Oct. 12	16.39	13.18	12.52	80.4	13.6	2,388		900	32
	Average				15.72	12.33	11.71	78.3	13.6	2,388		1,105	43
15424	Mrs. Lizzie Elwood	Red Willow	Kleinwanzlebener	Oct. 15	14.95	11.05	10.50	73.7				1,650	37
16478	E. T. Libbee	Richardson	Vilmorin Improved	Nov. 17	20.67	16.65	15.82	80.6	21.3	4,923		380	13
16047	Wm. Doekring	Saline	French	Oct. 31	18.37	15.00	14.25	82.2				875	31
16048	do	do	German	Oct. 31	19.17	14.90	14.16	77.7				790	28
	Average				18.77	14.95	14.21	80.0				883	30
15154	J. S. Kiff	Sheridan	French	Oct. 3	14.03	10.82	10.27	77.3				1,185	42
16029	do	do	do	Oct. 30	13.58	9.50	9.03	70.0				1,550	55
	Average				13.81	10.16	9.65	73.7				1,368	49
15506	S. G. Swigart	Sherman	German	Oct. 17	14.68	10.13	9.62	69.0				750	26
16120	T. M. Burke	do	Kleinwanzlebener	Nov. 2	17.79	12.25	11.64	68.9	8.2	1,187		700	25
16121	do	do	Vilmorin Improved	Nov. 2	17.31	13.35	12.69	77.2	6.0	1,061		630	22
	Average				16.59	11.91	11.32	71.7	7.1	1,124		693	24
15110	Oscar A. Garton	Sioux	German	Sept. 28	15.47	10.76	10.22	69.5				260	9
15191	B. F. Thomas	do	Bulteau Desprez	Oct. 28	13.98	10.28	9.77	73.4	18.3	2,339		685	24
15948	H. T. Merriam	do	Kleinwanzlebener	Oct. 28	21.27	17.10	16.24	80.4	13.5	3,652		280	10
	Average				16.91	12.71	12.08	74.4	16.9	2,996		412	14

NEBRASKA—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Grams.	Ounces.
15084	Christian Hecker	Valley	Vilmorin Improved	Sept. 24	19.16	14.21	13.50	74.2	.....	.....	840	30
15063	Frank Grusel	Webster	Kleinwanzlebener	Oct. 13	12.92	10.05	9.55	77.3	.....	.....	870	31
15364	.....	do	Vilmorin	Oct. 13	14.32	11.09	10.52	77.5	.....	.....	855	30
	Average	.....	.....	.....	13.62	10.57	10.04	77.4	.....	.....	863	31
15784	J. F. Miller	York	Kleinwanzlebener	Oct. 28	17.37	13.65	12.97	78.6	16.6	3,053	629	22
	Average of State	.....	.....	.....	16.22	12.37	11.67	75.3	13.2	2,351	975	35

NEVADA.

16024	H. H. Springmeyer	Douglas	Kleinwanzlebener	Oct. 30	16.59	13.25	12.59	80.0	.....	.....	735	26
15145	H. H. Caryell	Elko	do	Oct. 2	16.39	13.40	12.73	81.7	.....	.....	690	22
15781	do	do	do	Oct. 28	17.67	14.60	13.87	82.6	.....	.....	465	16
	Average	.....	.....	.....	17.03	14.00	13.30	82.2	.....	.....	548	19
15040	R. H. McDowell	Washoe	Kleinwanzlebener	Oct. 25	22.87	19.00	18.05	83.0	3.0	811	120	4
15050	do	do	do	Oct. 25	22.87	20.00	19.00	87.5	12.4	3,968	265	9
15051	do	do	do	Oct. 25	19.67	17.00	16.14	86.4	5.9	1,486	300	11
15052	do	do	do	Oct. 25	23.67	22.00	20.90	93.0	7.8	2,735	300	11
15053	do	do	do	Oct. 25	19.17	15.80	15.01	82.4	5.9	1,317	310	11
15054	do	do	do	Oct. 25	21.47	20.20	19.19	94.1	14.6	4,709	215	8
15055	do	do	Vilmorin Improved	Oct. 25	21.97	19.20	18.24	87.2	6.1	1,770	215	8
16521	do	do	Acclot rouge	Nov. 20	20.00	18.70	17.77	92.7	4.3	1,286	240	8
16522	do	do	Bulleau Desprez	Nov. 20	20.50	20.60	19.57	90.9	8.8	2,825	305	11
16523	do	do	Kleinwanzlebener	Nov. 20	20.50	18.90	17.96	91.4	10.3	4,827	340	12
16524	do	do	Kleinwanzlebener Improved	Nov. 20	20.50	19.25	18.29	93.1	6.5	1,997	240	8
16525	do	do	do	Nov. 20	19.97	17.80	16.91	88.9	4.0	1,084	235	8
16526	do	do	do	Nov. 20	21.67	18.90	17.96	87.2	2.9	840	145	5
16527	do	do	Vilmorin Improved	Nov. 20	20.77	18.90	17.96	91.0	12.4	3,656	320	11
16528	do	do	Bulleau Desprez	Nov. 20	20.17	18.30	17.38	90.7	6.3	1,793	280	10
	Average	.....	.....	.....	21.18	18.97	18.02	89.3	7.8	2,340	255	9
	Average of State	.....	.....	.....	20.47	18.10	17.20	88.0	7.8	2,340	314	11

NEW HAMPSHIRE.

16028	E. C. Daniels.....	Grafton.....	French	Oct. 30	15.28	12.25	11.64	80.0	14.8	2,486	540	19
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NEW JERSEY.

15050	Wm. Young	Morris.....	Vilmorin Improved	Sept. 19	10.91	7.72	7.33	70.8	13.07	1,236	490	17
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NEW MEXICO.

15063	H. B. Ashenfelter	Colfax	Lane's Imperial	Sept. 21	17.87	13.63	12.95	76.3	16.5	2,940	760	27
15888	do	do	do	Oct. 26	17.37	14.50	13.77	83.5	19.4	4,027	480	17
	Average				17.62	14.07	13.36	79.9	13.0	3,484	620	22
15112	C. W. Greene	Eddy	White	Sept. 28	16.97	12.41	11.79	73.1	14.7	2,287	420	15
15113	do	do	Kleinwanzlebener	Sept. 28	16.77	12.19	11.58	72.7	19.4	2,949	810	29
15114	do	do	Vilmorin Improved	Sept. 28	15.57	10.78	10.24	69.2	* 15.9	2,029	750	27
15889	Samuel Hughes	do	German	Oct. 26	16.15	11.50	10.93	71.2	.....	.....	1,500	53
15890	do	do	Hale's Improved	Oct. 26	18.97	13.25	12.59	70.0	.....	.....	570	29
15891	E. G. Shields	do	do	Oct. 26	15.37	12.50	11.88	72.0	.....	.....	1,111	30
15892	do	do	German	Oct. 26	23.67	18.75	17.81	79.2	.....	.....	510	18
16547	Maynard Sharpe	do	do	Nov. 21	29.64	22.50	21.27	75.9	.....	.....	690	24
16548	do	do	French	Nov. 21	23.64	23.00	21.85	77.6	.....	.....	550	20
	Average				20.31	15.21	14.45	73.4	16.7	2,422	768	27
16157	Alex. Kronig	Mora	German	Nov. 13	19.67	16.25	15.44	82.6	11.3	2,601	550	20
16158	do	do	French	Nov. 16	19.27	16.50	15.68	85.6	11.3	2,719	800	29
16447	Wm. Kronig	do	Kleinwanzlebener	Nov. 16	15.75	11.00	10.45	70.0	.....	.....	1,410	50
	Average				18.23	14.53	13.86	79.4	11.3	2,660	920	33
16461	Peter Roth	San Miguel	Kleinwanzlebener	Nov. 16	16.75	10.90	10.36	65.1	.....	.....	825	29
16462	H. T. Vaille	do	German	Nov. 16	20.17	14.40	13.68	71.4	.....	.....	950	34
16616	John Pendaries	do	French	Dec. 7	16.94	13.00	12.35	76.7	.....	.....	520	19
	Average				17.95	12.77	12.13	71.1	.....	.....	765	27
	Average of State				19.21	14.53	13.81	74.8	15.5	2,793	777	28

NEW YORK.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.
						Juice.	Beet.				
16207	Henry Weber.....	Erie.....	French.....	Nov. 5.....	16.03.....	<i>Per ct.</i> 12.50.....	<i>Per ct.</i> 11.87.....	<i>Per ct.</i> 78.0.....	<i>Tons.</i>	<i>Pounds.</i>	<i>Ounces.</i> 840.....
16208	.....do.....	.....do.....	.....do.....	Nov. 5.....	16.87.....	13.40.....	12.63.....	79.4.....	.....	.....	985.....
	Average.....	.....	.....	.....	16.45.....	12.95.....	12.25.....	78.7.....	.....	.....	912.....
16261	Bryant W. Taylor.....	Genesee.....	.....	Nov. 7.....	17.17.....	13.70.....	13.02.....	80.1.....	.....	.....	650.....
16423	David Marsh.....	Livingston.....	Bulteau Desprez.....	Nov. 16.....	13.23.....	9.25.....	8.79.....	69.9.....	.....	.....	1,120.....
	Average of State.....	.....	.....	.....	15.83.....	12.21.....	11.58.....	76.8.....	.....	.....	899.....

NORTH DAKOTA.

16292	Martin Plutzkow.....	Cavalier.....	Bulteau Desprez.....	Nov. 9.....	13.65.....	8.65.....	8.22.....	63.4.....	.....	.....	500.....
15104	J. R. McFadden.....	Diekey.....	French.....	Sept. 6.....	17.14.....	10.90.....	10.35.....	63.6.....	13.0.....	1,544.....	870.....
16247	.....do.....	.....do.....	.....do.....	Nov. 7.....	18.37.....	13.25.....	12.59.....	72.1.....	19.6.....	3,210.....	440.....
15898	Geo. O. Letson.....	.....do.....	Bulteau Desprez.....	Oct. 26.....	15.97.....	12.65.....	12.20.....	80.5.....	.....	.....	600.....
	Average.....	.....	.....	.....	17.16.....	12.33.....	11.71.....	72.1.....	16.3.....	2,377.....	637.....
16027	W. B. Willey.....	La Moure.....	Bulteau Desprez.....	Oct. 30.....	18.59.....	14.00.....	13.31.....	75.3.....	16.3.....	2,945.....	606.....
13315	Matt. Fonstad.....	McIntosh.....	Kleinwanzlebener.....	Oct. 12.....	17.09.....	14.71.....	13.98.....	86.1.....	.....	.....	340.....
16291	P. Hagen.....	.....do.....	.....	Nov. 9.....	21.47.....	13.25.....	14.49.....	71.0.....	.....	.....	285.....
16340	Julius Erickson.....	.....do.....	German.....	Nov. 11.....	16.29.....	12.60.....	11.97.....	77.3.....	.....	.....	1,110.....
	Average.....	.....	.....	.....	18.28.....	14.19.....	13.48.....	78.1.....	.....	.....	578.....
16063	A. S. Freegood.....	Nelson.....	Kleinwanzlebener.....	Oct. 31.....	19.57.....	13.90.....	13.20.....	71.0.....	15.2.....	2,573.....	215.....
15251	Wm. L. Hall.....	Stutsman.....	.....	Oct. 9.....	12.03.....	8.18.....	7.77.....	68.1.....	.....	.....	1,405.....
15352	N. E. Farnsworth.....	.....do.....	Bulteau Desprez.....	Oct. 13.....	16.51.....	12.75.....	12.11.....	77.3.....	.....	.....	580.....
	Average.....	.....	.....	.....	14.27.....	10.47.....	9.94.....	72.7.....	.....	.....	993.....
	Average of State.....	.....	.....	.....	16.97.....	12.46.....	11.84.....	73.2.....	16.0.....	2,568.....	631.....

OHIO.

16421	S. R. Schrock	Ashtabula	French	Nov. 14	15.63	12.65	12.02	80.9	19.0	3,335	920	33
16503	J. F. Callender	do	Kleinwanzlebener	Nov. 24	18.13	13.10	14.35	83.3	.....	.....	485	17
	Average				16.88	13.88	13.19	82.1	19.0	3,335	703	25
15307	O. F. Benton	Anglaize	Kleinwanzlebener	Oct. 12	14.48	9.18	8.72	63.4	.....	2,203	775	27
16178	do	do	do	Nov. 4	15.82	11.90	10.31	75.0	14.4	.....	670	24
	Average				15.15	10.50	9.52	69.2	14.4	2,203	723	26
15246	Adam Stoner	Coshocton	Kleinwanzlebener	Oct. 9	15.43	11.83	11.24	76.9	.....	.....	520	18
15022	B. M. Castrell	Clark	Vilmorin	Sept. 14	14.59	10.47	9.95	71.2	.....	.....	1,825	64
15391	John Crabill	do	do	Oct. 24	14.15	9.85	9.34	68.2	.....	.....	1,130	41
15836	Geo. Elder	do	do	Oct. 24	13.25	8.55	8.55	67.8	.....	.....	590	21
15964	W. T. Orstot	do	do	Oct. 27	13.72	10.25	9.74	74.7	.....	.....	750	27
16203	Wm. Rice	do	do	Nov. 5	13.93	9.50	9.03	68.1	.....	.....	1,930	68
16313	R. K. Hunt	do	do	Nov. 10	18.67	12.75	12.11	68.3	.....	.....	605	21
16438	Jno. Woodman	do	Kleinwanzlebener	Nov. 16	18.63	14.40	13.68	77.3	.....	.....	960	34
	Average				15.28	10.90	10.34	70.8	.....	.....	1,116	39
15904	Wm. Yantz	Erie	Vilmorin	Oct. 26	15.85	11.65	11.06	74.4	21.8	3,239	1,080	38
16236	John W. Sargeant	do	Vilmorin Improved	Nov. 6	17.29	13.65	12.97	78.9	.....	.....	355	12
16312	A. A. Storrs	do	Conical Improved	Nov. 9	15.97	13.25	12.59	83.0	23.7	4,472	1,100	39
16361	Wm. Atwater	do	Vilmorin Improved	Nov. 13	19.39	16.70	15.87	86.1	.....	.....	515	18
16486	Jacob Bach	do	Kleinwanzlebener	Nov. 19	18.23	14.55	13.82	79.8	12.0	2,390	750	26
16187	do	do	French conical	Nov. 19	16.23	13.80	13.11	85.0	22.0	4,422	1,075	38
16488	do	do	Vilmorin	Nov. 19	16.33	13.30	12.64	81.4	12.5	2,320	720	25
16489	do	do	White imperial	Nov. 19	13.53	10.60	10.07	79.1	24.0	3,451	860	30
16490	do	do	Bulleau Desprez	Nov. 19	16.03	12.50	11.88	77.9	.....	.....	1,175	42
16491	do	do	Red Croatian	Nov. 19	11.83	7.20	6.85	60.9	14.0	1,051	650	23
16492	F. E. White	do	German	Nov. 19	10.83	6.40	6.08	59.1	15.0	974	630	22
16493	Geo. Rose Kelly	do	Bulleau Desprez	Nov. 19	13.53	9.55	9.07	76.6	21.8	2,579	705	25
16520	H. C. Norton	do	Bulleau Desprez	Nov. 23	14.63	11.35	10.78	77.1	.....	.....	1,875	67
16581	Thad. Larch	do	German	Nov. 27	15.51	11.11	11.11	76.1	.....	.....	590	21
16601	C. T. Stuen	do	Bulleau Desprez	Nov. 29	14.38	9.85	9.36	68.5	.....	.....	520	18
16627	Jacob Buldoff	do	do	Dec. 7	18.89	15.35	14.58	81.2	.....	.....	2,050	72
16316	Geo. W. Ferguson	do	Kleinwanzlebener	Nov. 10	16.24	13.00	12.35	80.0	.....	.....	1,480	52
	Average				17.77	14.35	13.63	80.8	15.8	3,651	480	17
					15.68	12.15	11.46	76.7	18.3	2,855	923	32
16177	C. H. Chase	Geauga	Kleinwanzlebener	Nov. 4	17.84	14.00	13.30	78.5	13.1	2,468	535	19

16575	.....do	Vilmorin	Nov. 27	21.89	18.60	17.67	85.0	18.5	5,017	570	20
	Average			20.09	17.30	16.44	85.7	18.0	4,510	625	22
16438	John Woodman	Kleinwanzlebener	Nov. 16	18.63	14.40	13.68	77.3			960	34
15019	Nathan Varner	Bulteau Desprez	Sept. 10	9.69	6.00	5.70	52.0			1,260	45
15024	Chas. S. Seitz	Vilmorin, Improved	Sept. 14	15.91	13.23	12.57	83.2	24.5	4,623	460	16
15028	.....do	Mangelwurzel	Sept. 14	7.46	3.61	3.43	48.4			1,100	39
	Average			11.69	8.42	8.00	65.8	24.5	4,623	780	28
15826	D. H. Wilder	Trumbull	Oct. 24	16.27	13.55	12.88	83.2	12.9	2,494	755	27
15827	.....do	Vilmorin	Oct. 24	15.65	10.60	10.07	67.7			1,020	36
16257	.....do	Kleinwanzlebener	Nov. 7	18.37	15.25	14.49	83.0	15.1	3,277	340	17
16258	.....do	Vilmorin Improved	Nov. 7	17.37	14.85	14.11	85.5	22.2	4,353	330	12
16259	.....do	French	Nov. 7	17.17	13.65	12.97	79.5	20.5	3,853	520	18
16302	W. H. Bushnell	.....do	Nov. 13	16.77	12.85	12.21	76.6	13.8	2,754	475	17
16204	Chas. N. Yorks	.....do	Nov. 5	17.67	14.25	13.44	84.7	17.4	3,431	980	35
16315	Albert Barber	Vilmorin Improved	Nov. 10	18.77	15.90	15.11	84.7	19.6	4,526	620	22
16395	Wm. King	French	Nov. 14	16.87	13.55	12.87	80.3			900	32
16582	J. A. Bettcher	Vilmorin	Nov. 27	16.99	13.70	13.01	80.6			1,010	36
	Average			17.19	13.82	13.12	80.2	17.4	3,524	695	25
15086	Louise F. Fullmer	Wyandot	Oct. 29	16.83	12.85	12.22	76.3			1,820	64
	Average of State			16.23	11.93	11.33	73.5	16.9	3,055	882	31

OKLAHOMA.

15004	F. M. Ferris	White	Aug. 20	12.58	6.71	6.37	53.3			1,815	48
		Oklahoma									

OREGON.

15222	Herman Benke	Benton	Oct. 8	17.49	13.88	13.18	79.3			370	13
15005	J. J. Nye	.....do	Oct. 19	16.97	13.30	12.63	78.4	7.5	1,340	555	20
16012	C. J. Bishop	Bulteau Desprez	Dec. 2	17.61	15.40	14.63	87.5	16.6	3,835	335	12
16296	G. H. Rosbrook	.....do	Nov. 29	16.89	14.05	13.35	83.1	6.5	1,306	300	11
16059	Henry Denlinger, jr.	Kleinwanzlebener	Dec. 21	17.64	13.05	14.30	85.4	25.9	5,798	1,580	56
	Average			17.32	14.34	13.71	82.8	14.12	3,069	628	22

OREGON—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
15187	Thomas Daniels	Clackamas	.....	Oct. 6	22.68	Per ct. 19.88	Per ct. 18.88	87.6	16.7	4,993	500	18
16195	O. P. Yoder	do	Kleinwanzlebener	Nov. 19	16.83	14.55	13.82	86.5	.....	.....	105	4
16557	Richard Scott	do	do	Nov. 23	15.91	12.25	11.64	77.9	.....	.....	1,155	41
	Average				18.47	15.56	14.78	81.2	16.7	4,993	586	21
15338	Clarence Reed	Columbia	.....	Oct. 24	19.67	16.50	15.67	83.9	17.0	4,036	275	10
16153	do	do	Kleinwanzlebener	Nov. 3	19.67	15.60	14.82	79.8	20.0	4,270	860	29
16317	J. C. Johnson	do	do	Nov. 10	16.17	13.90	13.21	86.0	11.5	2,358	555	19
	Average				18.50	15.30	14.56	81.7	16.2	3,554	546	19
16569	J. M. Perkins	Coos	.....	Nov. 27	16.31	13.00	12.35	80.8	.....	.....	1,020	36
16570	Math. Kerrigan	do	Kleinwanzlebener	Nov. 27	17.31	14.50	13.77	83.8	.....	.....	600	21
16572	do	do	Vilmorin	Nov. 27	17.71	14.65	13.92	80.5	.....	.....	820	29
16571	Thos. B. Fox	do	Kleinwanzlebener	Nov. 27	19.31	16.80	15.96	87.0	.....	.....	975	34
16573	T. T. Smith	do	Vilmorin Improved	Nov. 27	17.51	13.85	13.16	79.1	.....	.....	865	31
	Average				17.63	14.56	13.83	82.6	.....	.....	860	30
15149	W. L. Tower	Douglas	.....	Oct. 3	21.03	17.74	16.85	84.3	.....	.....	340	12
15032	Edward Albright	Jackson	.....	Sept. 15	22.57	18.94	17.99	83.9	17.8	4,849	570	20
15117	J. G. Stevenson	Lane	.....	Sept. 28	15.67	12.15	11.54	77.5	6.5	1,049	115	4
16925	Wm. N. Crow	do	Vilmorin Improved	Oct. 30	18.69	14.65	13.36	77.7	.....	.....	565	20
16152	H. C. Perkins	do	do	Nov. 3	17.17	13.95	13.25	81.2	.....	.....	475	17
15905	J. H. Crow	do	do	Oct. 26	20.68	16.03	16.63	84.6	11.8	2,995	230	8
16356	C. J. Dodd	do	French	Nov. 11	17.99	15.10	14.35	83.9	.....	.....	815	29
16618	Lafayette Martin	do	.....	Dec. 21	15.35	12.67	12.05	82.5	.....	.....	1,100	39
	Average				17.49	14.24	13.53	85.4	9.2	2,018	550	20
16126	John Withler	Linn	.....	Nov. 2	17.81	14.15	13.42	79.5	.....	.....	180	6
15375	Jacob Baber	Marion	.....	Oct. 14	16.17	12.35	11.73	76.2	.....	.....	1,365	48
15066	J. Voorhees	do	.....	Oct. 19	16.87	14.45	13.73	85.7	20.3	4,332	560	20
	Average				16.52	13.40	12.73	81.1	20.3	4,332	962	34

16483	James Douglas	Polk	German	Nov. 18	15.17	12.10	11.50	79.8	.....	880	31
15631	J. E. David	Sherman	.....	Sept. 15	18.77	13.55	12.86	72.2	.....	435	15
15288	J. H. Logan	Umatilla	French	Oct. 10	18.69	15.12	14.36	80.9	.....	395	14
16585	W. R. Wise	Union	.....	Nov. 27	17.39	14.10	13.40	81.0	.....	980	35
16586	.....do	.....do	.....	Nov. 27	17.59	14.55	13.82	82.6	.....	1,130	40
	Average	.....	.....	.....	17.49	14.32	13.61	81.8	.....	1,055	35
15133	J. H. Rinck	Washington	Kleinwanzlebener	Oct. 1	14.77	12.67	12.04	85.8	.....	2,401	9
16231	A. N. Ault	do	Vilmorin	Nov. 6	18.29	15.00	14.25	82.0	.....	3,204	15
16584	.....do	.....do	.....do	Nov. 27	14.38	9.80	9.31	68.3	.....	2,467	48
	Average	.....	.....	.....	15.48	12.49	11.86	80.7	.....	2,690	24
	Average of State	.....	.....	.....	17.72	14.57	13.84	82.2	.....	3,480	23

PENNSYLVANIA.

16445	W. W. Claypool	Armstrong	.....	Nov. 16	16.03	11.85	11.26	73.9	.....	780	21
16463	I. N. Meals	Butler	Vilmorin Improved	Nov. 16	19.67	16.35	15.53	83.1	.....	3,798	17
16418	T. F. Pennan	Lackawanna	Erfurt Giant	Nov. 14	17.95	12.00	11.40	66.9	.....	650	23
16419	.....do	.....do	Red French	Nov. 14	24.17	20.65	19.62	83.4	.....	366	12
	Average	.....	.....	.....	21.06	16.32	15.51	77.5	.....	508	18
16030	Frank E. Shannon	Venango	Bultean Desprez	Oct. 30	15.08	11.00	10.45	72.9	.....	2,998	37
15240	G. W. Bauer	Warren	German	Oct. 9	15.53	12.58	11.95	81.0	.....	1,519	23
15241	.....do	.....do	French	Oct. 9	17.03	13.42	12.81	78.9	.....	400	14
	Average	.....	.....	.....	16.28	13.00	12.38	79.9	.....	1,519	19
	Average of State	.....	.....	.....	17.78	13.98	13.29	78.7	.....	2,772	22

SOUTH DAKOTA.

15776	A. H. Hall	Anrona	Desprez	Oct. 23	16.35	11.50	10.93	73.0	.....	785	28
15778	.....do	.....do	French	Oct. 23	14.55	10.25	9.74	76.4	.....	980	35
15874	Geo. E. Babcock	.....do	Kleinwanzlebener	Oct. 26	16.65	12.00	11.45	72.1	.....	950	34
15875	.....do	.....do	.....do	Oct. 26	16.35	11.25	10.65	68.8	.....	1,670	59

SOUTH DAKOTA—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Per ct.				Pounds.	Ounces.
16473	D. G. Townsend.	Aurora	French	Nov. 17	18.57	Per ct.	Per ct.	Per ct.	Tons.	Pounds.	Grams.	Ounces.
16474	do	do	German	Nov. 17	17.97	13.00	12.35	70.00	19.6	3,038	1,017	36
	Average				16.74	11.86	11.27	70.90	21.55	3,878	1,070	35
15810	E. W. Crouch	Beadle	Desprez	Oct. 24	16.67	12.60	11.99	75.60	9.0	1,470	1,080	38
15840	C. A. Blake	do	do	Oct. 24	18.47	14.40	13.68	77.90	23.0	4,728	785	28
15861	A. W. Wilmarth.	do	Kleinwanzlebener	Oct. 26	19.27	15.20	14.45	78.90	23.0	4,728	330	12
15873	Jno. H. Miller	do	Mette	Oct. 26	20.07	16.50	15.67	82.20	17.4	2,389	865	31
16017	A. W. Wilmarth.	do	do	Oct. 30	22.09	13.03	12.64	60.20	17.4	2,389	180	6
16217	W. E. Moxon	do	Vilmorin	Nov. 6	12.88	8.20	7.79	63.70	17.4	2,389	1,435	51
16223	Albert Patten	do	do	Nov. 6	13.28	8.40	9.17	72.70	17.4	2,389	1,570	55
16223	do	do	do	Nov. 6	11.88	8.40	7.98	70.70	17.4	2,389	740	61
15338	Wilfred Baker	do	do	Nov. 16	16.41	13.03	13.23	83.00	17.4	2,389	1,800	31
16470	C. W. Barringer	do	Mette	Nov. 16	22.67	17.80	16.91	78.00	17.4	2,389	405	14
16471	J. A. Colcord	do	do	Nov. 16	22.67	20.15	19.14	90.50	17.4	2,389	235	8
16472	S. B. Melville	do	Kleinwanzlebener	Nov. 16	24.27	19.05	18.67	81.00	17.4	2,389	425	15
16567	B. E. McIlvaine	do	Desprez	Nov. 27	15.29	10.50	9.98	68.60	17.4	2,389	1,030	36
16568	Frank Campbell	do	do	Nov. 27	16.09	11.35	10.79	70.50	17.4	2,389	970	34
	Average				18.00	13.67	13.00	75.90	16.5	2,862	854	30
15863	Louis Schneider	Bonhomme		Oct. 26	14.95	10.00	9.50	66.90	16.5	2,862	1,345	48
16020	P. D. Davis	Brookings	Bulteau Desprez.	Oct. 30	18.39	13.95	13.26	75.80	8.3	1,505	400	14
16422	Agricultural station.	do	Vilmorin	Nov. 16	15.83	12.60	11.97	79.70	10.8	1,859	685	24
16429	do	do	Bulteau Desprez.	Nov. 16	16.63	13.00	12.35	78.20	14.2	2,476	605	21
16430	do	do	Kleinwanzlebener	Nov. 16	17.43	13.80	13.11	79.20	10.7	2,005	715	25
16431	do	do	do	Nov. 16	16.03	12.35	11.83	77.00	16.3	2,658	525	19
	Average				16.86	13.12	12.50	77.80	12.06	2,100	586	21
15100	S. W. Narrengang	Brown	Vilmorin	Sept. 26	16.56	13.02	12.37	78.00	12.06	2,100	983	35
15101	do	do	do	Sept. 26	17.16	12.99	12.34	75.90	12.06	2,100	360	13
15194	do	do	French	Oct. 7	13.58	9.76	9.27	61.70	12.06	2,100	720	26
15195	do	do	do	Oct. 7	15.08	9.86	9.37	65.70	12.06	2,100	390	14
15196	do	do	Vilmorin	Oct. 7	16.08	11.37	10.70	70.10	15.8	2,139	480	17
15197	do	do	Kleinwanzlebener	Oct. 7	15.58	11.83	11.24	75.90	15.8	2,139	250	9
15559	do	do	Vilmorin	Oct. 19	18.97	15.60	14.82	82.20	9.8	2,172	410	15
15563	do	do	Bulteau Desprez.	Oct. 19	16.65	12.15	11.54	73.00	16.8	2,555	410	15

Summary of results by States and counties—Continued.

SOUTH DAKOTA—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
15813	Geo. Z. Richards	Butte	Oxnard	Oct. 24	20.67	Per. ct.	Per. ct.	Per. ct.				240
16428	Andrew Craig		Desprez	Nov. 16	20.03	13.80	14.96	76.00				475
16606	do		do	Nov. 30	21.03	17.70	16.81	78.90				640
	Average				20.58	16.40	15.58	79.60				450
16051	Myron T. Wolverton	Campbell	Bulteau Desprez	Oct. 31	17.27	13.25	12.59	76.60	13.3	2,314	645	23
15150	Jesse E. Nale	Charles Mix	French	Oct. 3	18.83	15.64	14.86	83.00	17.2	3,836	330	12
15500	do		German	Oct. 17	20.79	16.56	15.82	79.70	11.9	2,683	315	11
	Average				19.56	16.10	15.34	82.40	14.55	3,264	322	11
15168	John Jones	Clark		Oct. 5	16.28	11.42	10.85	70.10			670	24
16262	A. Grover		French	Nov. 7	17.67	13.80	13.11	78.10			400	14
	Average				16.98	12.61	11.97	74.30			535	19
15127	N. G. Swanson	Clay	Kleinwanzlebener	Sept. 29	17.69	13.34	12.67	71.70			315	11
15248	L. A. Anderson		Vilmorin	Oct. 9	18.13	14.32	13.61	78.60			765	27
15250	do		do	Oct. 9	16.93	13.10	12.46	77.00			785	28
15926	R. S. Gaylord		do	Oct. 27	16.34	13.35	12.69	81.70			1,030	36
15927	do		do	Oct. 27	15.54	12.50	11.88	80.40			1,320	47
	Average				16.93	13.32	12.65	78.90			843	30
15457	Peter Lappire	Codington	White	Oct. 16	15.28	11.48	10.91	75.10			630	22
15872	John Twining	Custer	Bulteau Desprez	Oct. 26	20.97	15.25	14.50	72.70	16.1	2,904	300	14
16052	Thomas Scholfield	Davieson	do	Oct. 31	17.17	13.75	13.06	80.00			1,220	43
16053	do		do	Oct. 31	17.77	13.65	12.97	76.80			1,290	46
16246	J. C. Clapham		do	Nov. 7	19.17	15.95	15.15	83.20	13.7	3,118	640	23
	Average				18.03	14.45	13.73	80.10	13.7	3,118	1,050	37
15079	Joshua Gower	Day	German	Oct. 21	21.13	16.30	15.49	77.10	13.0	2,813	375	13
16164	August Krause		French	Nov. 4	18.24	13.70	13.01	75.10			440	16
16189	E. O. Esget		Kleinwanzlebener	Nov. 5	16.43	12.05	11.42	73.30	13.0	1,968	525	19

16459	E. T. Odgaard.....	do	Bulteau Desprez.....	Nov. 16	19.27	14.75	14.01	74.10	17.4	3,263	225	8
16014	C. E. Wheeler.....	do	Kleinwanzlebener.....	Oct. 30	22.79	15.85	15.06	70.00	.....	.....	565	20
	Average.....											
16188	C. H. Lester.....	Denel	Bulteau Desprez.....	Nov. 5	16.43	12.90	12.26	78.30	7.5	1,299	695	25
15119	L. B. Greene.....	Douglas	Kleinwanzlebener.....	Sept. 29	11.54	6.42	6.10	55.90	.....	.....	1,290	46
16289	R. Barrows.....	do	do	Nov. 9	15.65	10.30	9.79	65.80	.....	.....	1,170	41
15779	N. R. Wetlauffer.....	do	Bulteau Desprez.....	Oct. 23	15.87	12.85	12.21	81.00	.....	.....	595	21
	Average.....				14.35	9.86	9.37	68.70	.....	.....	1,018	36
15928	Lester Crane.....	Edmunds	Desprez.....	Oct. 28	18.27	13.90	13.21	76.08	.....	.....	445	16
16190	R. Barrows.....	do	do	Nov. 3	21.17	15.30	14.54	72.30	.....	.....	310	11
16290	Henry Mundt.....	do	do	Nov. 9	18.87	14.13	13.44	75.00	10.4	1,973	242	9
	Average.....				19.43	14.45	13.63	74.00	10.4	1,923	332	12
15812	Henry Rose.....	Fall River	French.....	Oct. 24	16.17	13.85	13.16	85.60	19.0	3,807	590	21
15405	R. Jungwirth.....	Faulk	French.....	Oct. 15	23.59	17.76	16.88	75.40	11.0	2,575	615	22
15407	do	do	Kleinwanzlebener.....	Oct. 15	23.57	19.27	18.31	81.70	10.2	2,735	385	14
15410	do	do	Imperial.....	Oct. 15	23.57	16.56	15.73	70.30	11.0	2,196	400	14
15406	Frank Jungwirth.....	do	do	Oct. 15	21.27	16.39	15.57	77.00	11.5	2,489	600	21
16098	S. S. Wentworth.....	do	Desprez.....	Nov. 2	15.29	10.50	9.55	69.30	20.8	2,596	1,095	39
16485	do	do	Champion.....	Nov. 17	14.07	9.80	9.31	69.63	24.5	2,864	1,275	45
16486	Martin Bellin.....	do	do	Nov. 14	17.67	13.40	12.73	75.90	.....	.....	788	28
	Average.....				18.43	14.38	14.01	74.00	14.8	2,580	737	31
15973	Thomas Street.....	Grant	Bulteau Desprez.....	Oct. 29	14.43	9.35	8.88	64.80	17.0	1,769	415	15
16101	P. E. Higgins.....	Hamlin	German.....	Nov. 2	15.89	11.10	10.55	69.83	.....	.....	430	15
16102	do	do	do	Nov. 2	16.79	11.75	11.16	70.00	.....	.....	405	14
	Average.....				16.34	11.43	10.85	69.90	.....	.....	417	14
15562	John Lovelace.....	Hutchinson	Kleinwanzlebener.....	Oct. 19	17.37	13.25	12.59	76.30	20.3	3,518	665	24
15366	S. W. Mills.....	do	Vilmorin.....	Oct. 19	16.05	11.75	11.16	73.20	.....	.....	860	30
16388	Jno. M. Downer.....	do	Desprez.....	Nov. 23	15.25	11.10	10.55	72.80	.....	.....	565	20
	Average.....				16.22	12.03	11.43	74.16	20.3	3,518	696	25
15017	Wm. E. Hammer.....	Hyde	French.....	Sept. 9	17.87	13.88	13.19	77.60	.....	.....	750	26
15991	Jacob Myers.....	do	do	Sept. 25	15.61	10.46	9.94	67.03	.....	.....	830	29
15106	Henry Nelson.....	do	Kleinwanzlebener.....	Sept. 28	22.69	17.22	16.36	75.90	.....	.....	670	24
16389	John Shearoll.....	do	Desprez.....	Nov. 13	19.67	15.25	14.59	77.50	18.3	3,709	285	10
	Average.....				18.96	14.20	13.52	77.20	18.3	3,709	634	22

Summary of results by States and counties—Continued.

SOUTH DAKOTA—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Grams. Ounces.
15559	L. A. Tillery.	Jerauld.	.....	Nov. 24	17.53	13.15	Per ct. 12.49	75.00	Tons.	.....	580	21
15286	W. A. Palmer.	Kingsbury.	Desprez	Oct. 10	13.28	7.66	7.28	57.00	.....	.....	1,150	41
15287	do	do	do	Oct. 10	13.68	10.73	10.19	68.30	.....	.....	1,000	35
15565	Walter Thornber	do	do	Oct. 19	17.77	13.35	12.68	70.40	19.6	3,428	550	19
15747	F. W. Collins	do	Kleinwanzlebener	Oct. 22	17.90	13.05	12.40	76.30	.....	.....	700	25
15866	D. M. Maxson	do	do	Oct. 26	20.27	15.75	15.01	77.70	.....	.....	420	15
15896	W. H. French.	do	do	Oct. 26	15.65	11.45	10.88	73.20	.....	.....	725	26
15897	J. S. French.	do	do	Oct. 26	18.37	13.50	12.83	73.50	.....	.....	515	18
Average					16.97	12.21	11.60	71.90	19.6	3,428	709	25
15124	Wm. Whitmore.	Lake.	French	Sept. 29	14.87	9.97	9.47	67.10	.....	.....	630	22
15125	do	do	German	Sept. 29	16.57	11.79	11.20	71.20	.....	.....	620	22
15131	Richard Lawless	do	Kleinwanzlebener	Oct. 1	14.85	10.89	10.34	73.30	.....	.....	1,265	45
15141	Fred Kruger	do	Vilmorin Improved	Oct. 2	14.68	11.30	10.73	77.00	.....	3,431	760	29
15142	J. J. Kramer	do	Kleinwanzlebener	Oct. 2	17.09	14.28	13.57	83.40	23.0	3,313	320	11
15147	F. D. Gilbert.	do	do	Oct. 3	18.43	13.87	13.17	74.70	12.0	2,196	485	17
15163	Henry H. Jones	do	German	Oct. 10	17.11	13.15	12.49	82.80	.....	.....	910	32
15266	M. W. Daily	do	French	Oct. 10	16.19	12.61	11.98	77.80	.....	.....	460	16
15268	Dr. J. R. Jones.	do	do	Oct. 10	14.58	10.96	10.41	75.00	.....	.....	1,475	52
15929	do	do	German	Oct. 27	19.14	14.50	13.78	75.80	19.6	3,633	335	12
15314	S. C. Saxby	do	French	Oct. 12	13.28	8.84	8.40	66.60	.....	.....	635	25
15353	H. P. Smith	do	Vilmorin	Oct. 13	16.91	12.46	11.85	73.30	.....	.....	450	16
15354	F. D. Fitts	do	Kleinwanzlebener	Oct. 13	16.11	12.35	11.74	76.70	.....	.....	860	30
15972	do	do	do	Oct. 29	16.03	11.55	10.97	72.10	.....	.....	570	20
15355	T. H. Odell	do	French	Oct. 13	19.11	14.21	13.50	74.40	17.8	3,252	585	21
15378	B. C. Kennedy	do	Kleinwanzlebener	Oct. 14	19.17	14.00	13.30	72.90	.....	.....	270	10
15408	F. L. Healey	do	French	Oct. 15	17.77	13.21	12.55	74.30	.....	.....	440	16
15409	Wm. Vanderhoof	do	Kleinwanzlebener	Oct. 16	17.59	13.61	12.93	77.40	.....	.....	490	17
15458	D. T. Scott.	do	do	Oct. 16	17.57	12.85	12.21	76.60	23.5	4,277	450	16
16148	do	do	French	Nov. 3	16.77	13.61	12.93	77.40	.....	.....	490	17
15499	Jno. Whitmore	do	do	Oct. 19	15.38	11.61	11.03	75.50	.....	.....	400	14
15556	Harry W. Fintzel	do	Kleinwanzlebener	Oct. 19	13.15	9.09	9.40	75.30	22.9	2,927	517	18
15557	Jos. C. Welling	do	do	Oct. 19	15.52	11.40	10.83	73.30	.....	.....	775	27
15558	D. McKinnon	do	French	Oct. 19	14.65	11.25	10.68	76.80	.....	.....	1,030	36
15560	Malcolm L. Clark	do	Kleinwanzlebener	Oct. 19	14.85	10.30	9.98	70.70	22.4	2,852	1,720	25
15561	J. McGilnay	do	do	Oct. 19	12.45	8.65	8.22	69.30	.....	.....	1,380	49
15564	M. L. Guecker	do	do	Oct. 19	14.85	10.09	9.50	63.30	24.4	2,647	665	23

15777	Barney Barron	do	German	Oct. 23	14.35	10.20	9.65	71.70	.....	.....	685	24
15780	Dr. Daniels	do	French	Oct. 27	18.17	13.25	12.59	72.90	17.4	2,881	250	9
	Average				16.17	11.62	11.04	71.90	19.9	3,139	655	23
15811	Alex. Engh.	Lawrence			15.28	11.08	10.53	72.50	.....	.....	410	15
16021	Earl E. Boyce	Lincoln	Kleinwanzlebener	Oct. 30	17.49	13.95	13.26	79.70	.....	.....	320	11
16221	W. T. Pierce	McCook	do	Nov. 6	16.08	10.00	9.50	61.90	.....	.....	450	16
16099	G. B. Reid	McPherson	do	Nov. 2	19.31	14.80	14.07	76.70	.....	.....	515	18
15869	Rev. Ira D. Clark	do	do	Oct. 26	18.57	13.00	12.35	70.00	17.4	2,716	680	24
16099	Geo. B. Reid	do	Kleinwanzlebener	Nov. 2	18.31	14.75	14.01	80.60	12.6	2,568	285	10
16407	Geo. Roesler	do	German	Nov. 14	20.77	17.30	16.44	83.30	15.0	3,707	375	13
	Average				19.24	14.96	14.21	77.70	15.0	2,997	464	16
15678	J. S. Hanon	Marshall	French	Oct. 21	19.13	13.70	13.02	71.60	10.9	1,835	790	28
15871	E. M. Ireland	do	Bulteau Desprez	Oct. 26	21.17	14.25	13.53	67.40	.....	.....	530	19
	Average				20.15	13.97	13.27	69.30	10.9	1,835	660	23
16373	M. Bohlman	Miner	German	Nov. 13	17.19	12.45	11.83	72.40	15.6	2,410	502	18
15316	Valentine Seubert	Minnehaha	Vilmorin	Oct. 12	17.99	13.26	12.60	73.70	12.0	2,011	325	12
15459	Tollef Annundson	do	Kleinwanzlebener	Oct. 16	15.28	11.22	10.75	74.10	.....	.....	810	29
16288	Wm. Englehardt	do	French	Nov. 9	18.37	13.75	13.03	74.90	24.4	4,309	870	31
	Average				17.21	12.74	12.13	74.30	18.2	3,160	668	24
15864	James Wilson	Moody	Vilmorin	Oct. 26	18.37	14.55	13.83	79.20	20.4	4,033	590	21
15870	do	do	Kleinwanzlebener	Oct. 26	18.17	12.75	12.12	70.20	18.7	2,869	625	22
16219	do	do	do	Nov. 6	17.59	12.90	12.26	72.20	18.7	2,986	500	18
16220	do	do	Vilmorin	Nov. 6	19.09	14.60	13.87	76.50	20.7	3,964	310	11
	Average				18.30	13.70	13.02	74.50	19.6	3,462	506	18
15928	James Nailor, jr	Potter	White, globe	Oct. 27	18.64	12.55	11.93	67.30	.....	.....	225	8
15748	J. T. Stovell	Roberts	Kleinwanzlebener	Oct. 22	19.09	14.07	13.37	77.00	.....	.....	295	10
13971	John C. Reeve	do	Bulteau Desprez	Oct. 29	13.53	11.00	10.45	70.80	.....	.....	825	29
16377	A. H. Green	do	do	Nov. 13	18.77	14.60	13.87	77.80	.....	.....	830	29
16378	O. Wright	do	Kleinwanzlebener	Nov. 13	20.87	15.05	14.30	74.30	.....	.....	643	23
	Average				18.56	13.68	12.99	75.00	.....	.....	650	23
16054	James Salisbury	Sanborn	do	Oct. 31	20.27	14.60	13.87	72.00	.....	.....	550	19
16452	Simon Degaringer	do	Kleinwanzlebener	Nov. 6	21.73	16.30	15.49	75.00	13.9	2,915	665	23
	Average				21.00	15.45	14.68	73.50	13.9	2,915	607	21

15473	do	do	German	Oct. 16	11.28	6.95	6.60	61.6	870	31
	Average	do	do	do	11.83	7.42	7.05	62.7	805	28
16597	Geo. Harris	Davidson	Kleinwanzlebener	Nov. 29	19.09	15.60	14.82	81.7	300	11
	Average of State	do	do	do	14.02	9.23	8.77	65.8	552	20

TEXAS.

15006	P. Pierson	Bosque	Kleinwanzlebener	Aug. 25	15.59	8.60	8.17	55.2	895	32
15007	do	do	do	Aug. 25	13.89	8.22	7.81	58.2	1,110	39
	Average	do	do	do	14.78	8.41	7.99	57.2	1,002	35
15139	Jno. Burkhardt	Fayette	Kleinwanzlebener	Oct. 2	15.08	12.29	11.67	81.5	2,145	8
15140	do	do	Vilmorin Improved	Oct. 2	14.18	10.28	9.77	72.5	2,083	14
	Average	do	do	do	14.63	11.29	10.22	77.0	2,114	11
15135	J. A. Taylor	Hill	do	Oct. 2	17.19	12.30	11.69	71.5	1,870	8
15033	I. W. Hollingsworth	Johnson	Kleinwanzlebener	Sept. 15	14.07	9.01	8.56	64.0	865	34
16128	H. Stucke	Mason	French	Nov. 2	19.01	14.65	13.92	77.1	154	5
15041	W. B. Moss	Reeves	Red Top	Sept. 16	15.42	10.76	10.22	69.8	920	33
15000	R. Windsor	Rundels	Kleinwanzlebener	July 18	16.10	11.30	10.74	70.2	950	34
15001	do	do	Vilmorin Improved	July 18	15.20	11.10	10.54	73.0	830	29
	Average	do	do	do	15.65	11.20	10.64	71.6	890	31
	Average of State	do	do	do	15.57	10.85	10.31	69.1	1,663	23

VIRGINIA.

15056	O. K. Lapham & Co	Augusta	Bultean Desprez	Sept. 21	14.90	12.14	11.53	80.8	670	24
15057	do	do	Lane's Imperial	Sept. 21	11.35	8.21	7.80	72.3	860	30
15058	do	do	Vilmorin Improved	Sept. 21	14.55	11.18	10.62	76.2	660	24
15327	do	do	Lane's Imperial	Oct. 12	13.68	9.74	9.24	71.2	590	21
15328	do	do	Vilmorin	Oct. 12	16.39	12.37	11.75	75.5	420	15
15329	do	do	Diamond	Oct. 12	15.08	12.40	11.78	82.2	410	15
15330	do	do	Bultean Desprez	Oct. 12	14.48	10.91	10.37	75.4	540	19
15899	H. G. Lapham	do	Vilmorin	Oct. 26	17.27	13.25	12.59	76.7	510	18
15900	do	do	Lane's Imperial	Oct. 26	14.77	11.30	10.73	76.5	780	28

15054	do	do	Sept. 19	13.71	9.81	9.32	71.6	1,090	60
15055	do	do	Sept. 19	14.40	10.47	9.95	72.7	710	25
15065	do	do	Sept. 25	12.41	9.09	8.64	73.2	790	28
15068	do	do	Oct. 9	18.73	14.59	13.85	78.0	700	25
15245	do	do	Oct. 10	15.18	11.86	11.27	75.0	890	31
15242	do	do	Oct. 10	16.19	12.56	11.93	77.5	710	25
15243	do	do	Oct. 13	13.42	10.43	9.96	78.2	390	14
15248	do	do	Oct. 13	12.92	10.03	9.62	77.7	1,080	38
15369	do	do	Oct. 14	18.37	14.19	13.48	77.2	540	19
15373	do	do	Oct. 19	19.37	15.55	14.77	80.7	1,150	41
15600	do	do	Oct. 19	18.47	15.55	14.77	84.2	565	20
15601	do	do	Oct. 19	18.57	16.20	15.39	83.8	480	17
15604	do	do	Oct. 19	14.85	9.75	9.26	88.0	450	16
15650	do	do	Oct. 20	13.28	9.70	9.22	73.0	1,340	44
15650	do	do	Oct. 21	13.51	12.25	11.64	73.0	357	13
15681	do	do	Oct. 21	14.61	11.20	10.45	76.7	357	13
15681	do	do	Oct. 21	14.21	11.00	10.45	77.4	1,240	44
15683	do	do	Oct. 21	13.71	10.60	10.07	77.4	447	16
15684	do	do	Oct. 21	18.03	14.45	13.73	80.0	433	15
15785	do	do	Oct. 23	17.57	13.50	12.83	76.8	510	18
15786	do	do	Oct. 23	18.37	14.65	13.92	74.3	537	19
15787	do	do	Oct. 23	18.47	14.60	13.87	79.1	483	17
15788	do	do	Oct. 23	19.57	15.85	15.06	77.0	447	16
15945	do	do	Oct. 27	14.92	11.15	10.59	74.9	2,964	28
15946	do	do	Oct. 27	18.74	15.45	14.68	82.4	4,565	430
15947	do	do	Oct. 27	16.24	12.70	12.07	78.2	3,576	320
15948	do	do	Oct. 27	18.44	14.80	14.07	80.3	4,565	500
Average	do	do	.....	16.22	12.56	11.93	76.7	21.3	3,918
16856	Chas. G. Eady	Roanoke	Dec. 7	14.72	10.50	9.97	71.3	660	23
16617	Geo. A. Copp	Vilmorin Improved	Dec. 7	17.24	14.05	13.34	81.7	16.3	3,208
Average of State	do	do	.....	15.32	11.80	11.12	76.0	19.3	2,768

WASHINGTON.

15263	J. E. Ferris	Lewis	Oct. 10	15.98	9.68	9.20	74.4	860	30
15264	do	do	Oct. 10	17.08	12.30	11.68	72.3	455	16
15265	do	do	Oct. 10	18.19	15.39	14.62	84.5	570	20
Average	do	do	.....	17.08	12.46	11.83	77.1	9.8	1,493
16184	George Menzel	Snohomish	Nov. 18	17.47	15.10	14.35	86.4	565	30
15078	J. F. Wood	Vilmorin Improved	Sept. 23	19.13	16.18	15.37	84.5	1,529	840

Summary of results by States and counties—Continued.

WASHINGTON—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
16339	Henry Schutze	Stevens	Kleinwanzlebener	Nov. 21	20.11	Per ct. 17.25	Per ct. 16.39	Per ct. 83.8	Tons.		380	13
16340	do	do	French	Nov. 21	20.33	19.60	18.62	95.2			130	7
	Average				20.52	18.43	17.51	90.5			285	10
16306	A. N. Thornton	Whatcom	Vilmorin Improved	Nov. 9	18.47	16.25	15.44	88.0			525	19
16307	do	do	Kleinwanzlebener	Nov. 9	18.57	16.80	15.96	90.5			455	16
	Average				18.52	16.53	15.70	89.3			490	18
15694	Frank Ryder	Whitman	German	Oct. 21	19.23	15.75	14.96	81.9			345	12
15695	do	do	French	Oct. 21	16.63	13.25	12.59	79.7			575	20
	Average				17.93	14.50	13.78	80.8			460	16
	Average of State				18.34	15.23	14.47	83.9	8.17	1,511	524	18

WISCONSIN.

15205	R. R. Roberts	Adams		Oct. 8	17.09	13.15	12.51	77.3			290	10
15206	do	do		Oct. 8	16.29	12.59	11.96	77.3			440	16
15387	C. R. Lukle	do	German	Oct. 15	18.15	10.83	10.28	59.7			957	34
15439	O. Olson	do	Kleinwanzlebener	Oct. 16	14.63	11.34	10.77	77.3			483	17
16375	Hugh Barnes	do	White	Nov. 13	16.27	13.00	12.55	79.9	18.3	3,261	790	28
	Average				16.50	12.18	11.57	74.3	18.3	3,261	592	21
15985	M. H. W. Whitcomb	Barron		Oct. 15	18.17	14.65	13.91	80.7	10.9	2,210	77	3
15959	A. Gulickson	do	Vilmorin	Oct. 21	19.62	14.70	13.97	74.9			345	14
15759	M. A. Gates	do		Oct. 23	14.73	10.75	10.22	73.0			727	26
16039	Gilbert O. Wall	do		Oct. 31	17.77	14.20	13.49	80.0	24.6	4,795	580	20
	Average				17.58	13.58	12.90	77.2	17.75	3,503	442	16
15234	A. Kramer	Brown		Oct. 9	11.03	7.74	7.54	72.1			2,260	80
15253	do	do		Oct. 10	11.28	9.44	8.97	83.5			1,000	35

15342	Wendel Thelen.....do	Oct. 13	16.31	13.74	13.05	84.3	390	14
15397	Jacob Hein.....do	Oct. 15	12.85	9.02	8.57	76.4	1,043	37
15621	F. Zimmerman.....do	Oct. 20	13.48	9.20	8.74	66.3	1,213	43
15334	J. E. Duaine.....do	Oct. 13	13.22	8.80	8.36	66.6	680	24
15262	Rasmus Petersen.....do	Oct. 10	17.79	13.85	13.15	77.0	553	20
	Average.....		13.71	10.26	9.77	75.5	1,020	36
15394	Jacob Angst.....Buffalo	Oct. 15	12.74	8.15	7.94	64.2	483	17
15529	John B. Myer.....do	Oct. 19	17.77	14.03	13.58	80.5	363	13
15530	do.....do	Oct. 19	16.37	12.09	12.25	78.8	3,967	15
15751	George Hess.....do	Oct. 23	15.55	11.00	10.45	70.8	427	31
16181	Alfred Day.....do	Nov. 5	19.37	16.50	15.68	83.2	890	7
	Average.....		16.36	12.35	11.98	75.9	210	7
16216	Aug. A. Paulsen.....Calumet	Nov. 6	18.59	15.80	15.02	84.9	475	17
16238	Gottfried Abitz.....do	Nov. 6	11.18	7.65	7.27	68.3	280	10
	Average.....		14.89	11.73	11.15	76.6	445	16
15431	J. W. Thomas.....Chippewa	Oct. 16	14.58	10.85	10.31	74.4	363	13
15613	Joseph Ruff.....do	Oct. 20	14.08	10.70	10.16	76.0	765	27
15708	Phillip Rheingans.....do	Oct. 22	13.48	10.30	9.79	76.4	910	32
15713	M. Sarasin.....do	Oct. 22	12.38	9.15	8.69	73.8	1,135	40
15847	Auton Bischoel.....do	Oct. 26	13.75	9.89	9.32	71.3	1,253	44
15848	S. B. Peterson.....do	Oct. 26	13.55	9.35	8.89	69.0	1,230	43
	Average.....		13.64	10.03	9.53	73.5	1,077	38
15153	Lillie Vaughan.....Clark	Oct. 3	18.53	15.09	14.33	81.4	1,062	37
15173	do.....do	Oct. 5	19.01	15.65	14.87	82.4	425	15
15171	E. T. Nixdorf.....do	Oct. 5	16.18	11.86	11.37	73.3	340	12
15170	do.....do	Oct. 5	15.38	10.22	9.71	66.4	295	11
15207	do.....do	Oct. 8	17.19	12.88	12.22	74.9	370	13
15208	do.....do	Oct. 8	18.59	15.42	14.65	83.1	370	13
15254	do.....do	Oct. 10	13.58	9.49	9.01	69.7	360	13
15284	James Graham.....do	Oct. 15	15.35	11.29	9.79	73.6	410	14
15288	C. G. Garstner.....do	Oct. 20	15.48	10.85	10.26	70.1	613	22
15628	L. Randall.....do	Oct. 22	16.19	13.85	13.16	85.6	620	21
15705	Friedrich W. Katelyp.....do	Oct. 26	16.53	11.85	11.26	71.1	603	21
16420	August Erier.....do	Nov. 16	13.13	11.30	10.93	75.0	615	23
16426	do.....do	Nov. 16	13.13	11.30	10.93	75.0	689	24
15547	Fred. Miller.....do	Oct. 19	13.73	11.35	11.35	75.9	717	23
15391	Matt. N. Wells.....do	Oct. 15	14.65	11.05	10.36	75.7	633	22
	Average.....		16.25	12.35	11.97	75.7	507	18
15200	John Mishler.....Columbia	Oct. 8	13.99	9.31	9.00	66.5	620	22
15201	do.....do	Oct. 8	13.19	8.15	7.65	61.7	530	19
15298	I. L. Curtis.....do	Oct. 12	16.08	11.81	11.22	73.3	640	23
15521	R. Hopkins.....do	Oct. 19	16.55	11.50	10.97	69.5	987	35
15892	J. H. Randall.....do	Oct. 24	14.35	10.05	9.55	73.1	1,275	45

Summary of results by States and counties—Continued.

WISCONSIN—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
16145	D. Lasky.....	Columbia..	Kleinwanzlebener	Nov. 3	18.87	Per ct. 15.03	Per ct. 14.30	85.1	Tons. 20.9	4,580	675	24
16502	Thomas Anderson.....			Nov. 19	16.50	11.30	10.74	68.3	.....	.....	333	12
15915	Chas. M. Johnson.....			Oct. 27	18.24	13.65	12.98	74.8	.....	.....	495	17
	Average.....				15.97	11.35	10.80	71.5	20.4	3,327	694	25
15493	George J. Schoeffer.....	Crawford..	Kleinwanzlebener	Oct. 17	17.09	13.69	13.01	86.0	.....	2,644	860	30
15515	Albert Swatek.....			Oct. 19	12.44	7.20	6.84	57.9	.....	.....	3,266	115
15549	H. C. Wachter.....			Oct. 19	12.35	9.00	8.55	72.9	.....	.....	1,867	66
15651	C. C. Pickett.....			Oct. 20	12.28	7.60	7.22	61.9	.....	.....	1,433	51
	Average.....				13.54	9.37	8.91	69.7	13.1	2,644	1,857	66
15270	E. A. Wright.....	Dane.....	German.....	Oct. 10	16.08	11.81	11.22	73.3	.....	.....	1,010	36
15374	E. Evans.....			Oct. 14	15.15	10.89	10.34	72.1	.....	.....	335	12
15539	J. C. Cannon.....			Oct. 19	14.35	10.85	10.31	75.7	.....	.....	613	22
15845	J. R. Henderson.....			Oct. 26	17.37	12.20	12.09	73.1	.....	.....	597	21
16037	R. Williamson.....			Oct. 31	20.67	16.55	15.72	80.0	.....	.....	520	18
16214	W. J. Radke.....			Nov. 6	16.28	12.40	11.78	76.2	.....	.....	670	24
16239	W. H. Pauli.....			Nov. 7	23.77	19.00	18.05	80.0	.....	.....	415	15
15702	L. A. Halverson.....			Oct. 22	16.18	12.25	11.64	79.7	.....	.....	260	9
	Average.....				17.48	13.24	12.64	76.3	.....	.....	553	21
15255	William Kube.....	Dodge.....	Vilmorin Improved.....	Oct. 10	18.59	14.03	13.43	75.4	.....	.....	300	11
15260	.....do.....			Oct. 10	12.48	8.71	8.27	69.6	.....	.....	640	23
15479	James Woodrow.....			Oct. 16	13.38	8.89	8.45	66.4	.....	.....	1,970	70
15482	J. C. Laeske.....			Oct. 17	17.09	14.22	13.51	83.2	.....	.....	330	12
15489	Ludwig Somerfeld.....			Oct. 17	14.08	7.03	6.68	49.9	.....	.....	627	23
15624	A. C. Becker.....			Oct. 20	15.68	12.20	11.60	77.8	.....	.....	757	27
15789	Emil G. Breselov.....			Oct. 23	16.37	13.30	12.64	81.3	.....	.....	1,143	40
15066	Theo. Wademeyer.....			Oct. 29	18.03	14.65	13.92	81.2	.....	.....	417	15
16034	Frank Holz.....			Oct. 31	12.75	8.10	7.70	63.5	.....	.....	1,895	64
15432	O. R. Jones.....			Oct. 16	12.58	3.53	3.05	75.8	.....	.....	533	19
15437	George Rektan.....			Oct. 16	14.08	10.34	9.82	73.4	.....	.....	1,013	36
15608	Charles Discher.....			Oct. 21	14.41	10.65	10.12	73.2	.....	.....	1,707	60
16344	C. C. Deitz & Sons.....			Nov. 23	18.77	13.42	13.65	82.1	.....	.....	780	23
15794	J. H. Baehuber.....			Oct. 24	17.17	13.25	12.59	77.2	.....	.....	945	33

15804	Alfred O. Puls	do	Oct. 24	13.75	10.80	10.26	78.00	1,150	40
	Average	.....	.....	15.28	11.41	10.85	73.90	942	33
15552	Anton J. Eichinger	Door	Oct. 19	16.17	13.85	13.16	85.70	333	12
15945	L. R. Stephenson	do	Oct. 28	15.14	12.40	11.78	81.80	970	34
16330	Elmer Birmingham	do	Nov. 20	18.17	14.55	13.82	80.00	1,025	36
16654	Jas. McArdle	do	Dec. 21	18.27	14.54	13.81	79.50	1,075	38
16655	do	do	Dec. 21	17.54	13.13	12.92	75.30	1,050	37
	Average	.....	.....	17.06	13.70	13.02	80.50	891	27
15301	Thomas Darling	Dunn	Oct. 12	14.88	10.24	9.73	69.40	1,235	44
15495	S. Rudesill	do	Oct. 17	15.08	10.78	10.25	71.50	797	28
15664	John W. Atkinson	White	Oct. 21	14.61	11.20	10.64	76.70	597	21
15750	William Miller	do	Oct. 23	15.67	9.60	9.12	61.20	1,240	44
15801	William Moedy	do	Oct. 24	16.17	13.25	12.59	81.90	787	28
16081	R. Cunningham	White	Nov. 2	13.29	9.85	9.34	74.10	680	24
16374	M. McDonald	do	Nov. 13	18.85	12.20	11.59	65.30	1,233	44
16531	William Suser	do	Nov. 20	16.65	12.80	12.16	76.90	1,225	43
15433	Jno. Reinecke	Kleinwanzlebener	Oct. 16	14.08	10.66	10.13	75.70	1,373	48
	Average	.....	.....	15.48	11.18	10.62	72.50	1,019	35
15336	Carl Bernicke	Eau Claire	Oct. 13	14.42	11.18	9.08	77.60	950	34
15337	Robt. Schilling	do	Oct. 13	14.62	13.93	13.23	85.00	890	31
15338	Fred. Mueller	do	Oct. 13	15.02	11.97	11.37	79.80	570	20
15393	Jno. Nix	do	Oct. 15	15.15	10.08	7.68	66.30	313	11
15446	D. W. Sherman	do	Oct. 16	16.19	12.51	11.89	77.30	995	35
15519	R. J. Kepler	White	Oct. 19	13.85	10.55	10.02	76.20	800	28
15630	A. J. Cheesbro	do	Oct. 20	15.28	12.00	11.40	78.50	807	28
15700	G. W. Leutkin	do	Oct. 22	14.28	11.00	10.45	77.00	740	26
	Average	.....	.....	14.85	11.65	10.72	77.20	758	27
15230	Joseph Zeller	Fond du Lac	Oct. 9	14.63	11.34	10.77	77.70	910	32
15231	do	do	Oct. 9	15.03	11.03	9.53	73.63	1,000	35
15618	G. Stelton	German	Oct. 20	12.88	9.50	9.01	74.50	1,103	39
15790	Peter Korb	do	Oct. 23	12.45	8.50	8.08	68.30	2,013	71
15912	Henry L. Clapp	do	Oct. 27	16.20	11.35	10.79	70.00	530	19
16036	P. C. Jacobs	do	Oct. 31	17.97	14.25	13.54	83.50	790	28
	Average	.....	.....	14.86	11.00	10.29	74.60	1,058	37
15527	Jno. Masbaum	Forest	Oct. 19	14.45	9.80	9.31	67.80	727	26
15228	Anton Longmire	Grant	Oct. 9	17.03	12.77	12.13	74.10	520	18
15269	do	do	Oct. 10	15.79	12.61	11.98	80.00	450	16
15373	Jacob Baumgartner	do	Oct. 14	13.85	9.20	8.74	66.60	1,130	40
15536	Robt. H. Davidson	do	Oct. 19	13.45	9.60	9.12	71.40	1,167	41

Summary of results by States and counties—Continued.

WISCONSIN—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets	
						Juice.	Beet.				Pounds.	Grams. Ounces.
						<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Tons.</i>	<i>Pounds.</i>		
15807	Jno. Harris	Grant	French	Oct. 24	13.25	8.80	8.36	66.40	.....	.....	1,020	36
15808	N. E. France	do	German	Oct. 31	19.65	12.80	12.16	65.10	.....	.....	790	28
15809	do	do	do	Oct. 31	17.25	10.55	10.02	61.20	23.0	2,427	800	28
	Average				15.75	10.90	10.36	69.30	23.0	2,427	840	30
15198	Thomas Munger	Green	Kleinwanzlebener	Oct. 8	19.31	14.29	13.58	74.00	.....	.....	655	23
15199	do	do	French	Oct. 8	17.81	15.82	15.03	88.80	.....	.....	540	19
15184	Henry Osborn	do	do	Oct. 6	16.15	12.35	11.73	76.50	.....	.....	430	15
15209	do	do	do	Oct. 8	15.28	11.61	11.02	76.00	.....	.....	480	17
15212	Albert Daniels	do	Kleinwanzlebener	Oct. 8	17.68	12.80	12.29	72.90	8.7	1,437	435	15
15669	Jno. Elmer	do	do	Oct. 21	16.63	12.80	11.88	75.30	.....	.....	440	16
16035	C. J. Johnson	do	do	Oct. 31	21.17	15.90	13.11	73.10	.....	.....	870	31
16185	Thomas Sears	do	do	Nov. 5	14.53	11.35	10.78	73.00	18.9	2,869	670	24
	Average				17.32	13.34	12.68	77.10	13.8	2,153	565	20
15620	H. G. Bahr	Green Lake	do	Oct. 20	14.38	11.50	10.93	80.00	.....	.....	1,130	40
15396	D. L. Rogers	Iowa	White	Oct. 15	13.15	9.45	8.98	73.80	.....	.....	1,343	47
16537	Thomas Convey	do	Imperial	Nov. 21	16.79	12.80	12.16	75.50	.....	.....	990	35
16558	Frank Williams	do	Kleinwanzlebener	Nov. 11	18.29	12.60	11.97	68.90	20.7	3,428	903	32
15389	Martin Treseder	do	German	Oct. 15	14.55	10.93	10.38	75.10	.....	.....	907	32
	Average				15.70	11.45	10.87	73.30	20.7	3,428	1,036	37
15202	J. C. Loomis	Jackson	French	Oct. 8	14.78	11.32	10.75	76.60	.....	.....	980	35
15203	do	do	do	Oct. 8	13.38	10.32	10.00	78.00	.....	.....	1,310	46
15516	H. Overby	do	do	Oct. 19	12.65	7.30	6.94	57.70	.....	.....	1,000	57
	Average				13.60	9.71	9.23	71.00	.....	.....	1,297	46
15692	Julius Schoechert	Jefferson	French	Sept. 25	20.43	14.90	14.15	72.90	19.36	3,605	420	15
15093	do	do	Kleinwanzlebener	Sept. 25	21.93	16.96	16.11	77.30	19.36	4,252	356	13
15094	Ferdinand Hartwig	do	French	Sept. 25	20.13	16.38	15.56	81.30	8.96	2,045	510	18
15159	Otto Bartz	do	do	Oct. 3	16.59	12.88	12.24	78.50	.....	.....	865	31
15224	Chas. Jaquith	do	Kleinwanzlebener	Oct. 9	17.33	14.14	13.69	81.60	5.5	1,080	290	10
15235	Jno. Brockmann	do	do	Oct. 9	15.23	10.07	11.46	79.20	.....	.....	785	28
15236	do	do	do	Oct. 9	17.03	12.03	12.58	76.00	.....	.....	850	30

15395	Jos. Rafferty	do	German	Oct. 15	18.67	14.51	13.73	77.60	470
15443	Phineas Jaquith	do	do	Oct. 16	12.78	8.98	8.53	72.00	1,160
15443	L. M. Krippner	do	do	Oct. 20	17.08	12.00	11.40	70.30	317
15752	G. Marquart	do	do	Oct. 23	18.67	15.40	14.63	78.30	917
15793	Timothy Loeffler	do	Kleinwanzlebener	Oct. 24	19.36	13.80	13.01	81.50	980
15846	August Krueger	do	German	Oct. 26	16.67	12.90	12.23	77.40	440
15963	David Hildemann	do	do	Oct. 29	16.67	13.65	12.98	81.60	567
16070	Henry Trachte	do	do	Nov. 2	18.31	14.70	13.97	80.30	970
16074	Theo. Haney	do	Kleinwanzlebener	Nov. 2	18.31	14.70	13.97	79.20	990
16082	Wm. Piper	do	Vilmorin	Nov. 2	16.29	12.40	11.78	76.10	450
16083	A. A. Craig	do	do	Nov. 2	18.31	14.10	13.40	77.00	420
16084	Aug. Pischhaelfer	do	Kleinwanzlebener	Nov. 2	18.31	14.15	13.44	77.30	590
Average					17.72	13.65	13.08	14.20	2,777
15306	Chas. Grant	Juneau	French	Oct. 12	16.88	11.00	10.49	68.00	520
15353	Daniel Fowler	do	do	Oct. 19	18.97	14.75	14.01	77.80	250
15345	A. M. Smith	do	do	Oct. 19	13.75	10.50	9.98	76.40	933
15749	Chas. A. Pazik	do	Kleinwanzlebener	Oct. 23	17.37	13.75	13.06	87.10	710
15969	James Mutch	do	do	Oct. 29	16.43	12.50	11.88	76.10	960
16065	F. Prevey	do	Vilmorin Improved	Nov. 2	18.41	13.35	12.68	72.50	830
16293	E. Cook	do	do	Nov. 9	16.37	12.55	11.92	76.70	950
15487	N. W. Hess	do	Kleinwanzlebener	Oct. 17	13.58	10.43	9.91	71.50	1,217
Average					16.60	12.35	11.74	75.80	800
15372	G. H. Kröncke	Kenosha	Kleinwanzlebener	Oct. 14	10.34	6.86	6.52	66.60	1,600
15223	Jacob Roth	Kewaunee	French	Oct. 9	18.63	14.67	13.93	78.70	910
15306	Chas. Serrahn	do	do	Oct. 24	17.27	14.65	13.92	84.80	290
15852	William B. Ray	do	Kleinwanzlebener	Oct. 26	16.67	13.40	12.73	80.40	563
16009	Frank Wirth	do	do	Nov. 2	16.59	12.30	11.69	74.10	1,100
16275	J. W. Adams	do	French	Nov. 9	20.17	17.00	16.14	84.30	420
16276	Jno. Boanmaster	do	German	Nov. 9	19.37	15.65	14.87	80.60	990
16534	Steve Kulhanek	do	do	Nov. 21	19.91	15.05	14.30	75.00	600
16535	John Wagner	do	do	Nov. 21	19.81	15.70	14.92	79.30	940
16536	Wm. Oestrich	do	do	Nov. 21	21.60	17.25	16.39	79.80	310
16533	John Albright	do	do		15.59	11.05	10.50	70.80	660
Average					18.56	14.67	13.94	79.00	661
15340	W. F. Moeser	Lacrosse	do	Oct. 13	13.52	10.68	10.14	79.00	660
15670	Oscar F. Elwell	do	do	Oct. 23	14.55	11.00	10.45	75.60	633
15911	Jno. E. Lepke	do	Kleinwanzlebener	Oct. 27	15.42	12.25	11.64	79.40	840
15968	John Dawson	do	do	Oct. 29	16.73	13.20	12.54	78.90	870
16328	Frank Wiansch	do	do	Nov. 10	23.91	19.00	18.05	79.50	340
15430	Herman Bonstock	do	Imperial	Oct. 16	14.98	11.59	11.01	77.40	643
Average					16.52	12.95	12.31	78.30	664
15304	Thomas Buxton	Lafayette	do	Oct. 12	14.18	11.36	10.79	80.00	770
15670	E. M. Curbett	do	do	Oct. 21	16.33	12.80	12.16	78.90	867

Summary of results by States and counties—Continued.

WISCONSIN—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Grams. Ounces.
					<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	<i>Tons.</i>			
15672	R. D. Seely.....	Lafayette.....	White.....	Oct. 21.....	15.61	11.75	11.16	75.30	.....	.....	823	29
15698	R. T. Lillie.....	.....	.....	Oct. 22.....	15.28	11.80	11.21	77.20	.....	.....	847	30
15715	.....do.....	.....	.....	Oct. 22.....	15.68	11.85	11.26	75.50	.....	.....	713	25
	Average.....	.....	.....	.....	15.42	11.91	11.32	77.40	.....	.....	804	28
15300	H. Brennecke.....	Langlade.....	.....	Oct. 12.....	14.88	11.86	11.27	79.60	.....	.....	680	24
15762	Thomas Martin.....	Lincoln.....	German.....	Oct. 23.....	14.35	11.50	10.93	80.10	5.7	901	313	11
15371	Adam Bleser.....	Manitowoc.....	.....	Oct. 14.....	12.34	6.80	6.46	55.30	.....	.....	800	28
15434	E. Duolin.....	.....	.....	Oct. 16.....	14.28	10.61	10.08	74.30	.....	.....	863	30
15465	Julius Thieleke.....	.....	.....	Oct. 17.....	12.58	8.58	8.15	68.20	.....	.....	1,420	50
15482	Max Boehm.....	.....	.....	Oct. 19.....	11.95	7.70	7.32	64.40	18.1	1,538	1,233	44
15346	Job. Reznicek.....	.....	.....	Oct. 19.....	14.65	10.70	10.17	75.00	.....	.....	377	18
15965	F. W. Rades.....	.....	.....	Oct. 29.....	17.73	13.85	13.16	78.10	.....	.....	300	11
16270	H. C. Koch.....	.....	Kleinwanzlebener.....	Nov. 9.....	16.57	13.70	13.02	82.70	.....	.....	378	13
16566	Chas. Gurtandson.....	.....	Desprez.....	Nov. 27.....	18.91	13.40	12.72	70.90	.....	.....	550	19
15714	Jno. Cochems.....	.....	.....	Oct. 22.....	14.48	11.10	10.55	74.00	.....	.....	623	22
	Average.....	.....	.....	.....	14.83	10.72	10.18	71.43	18.1	1,538	727	26
15344	Frank Feckner.....	Marathon.....	.....	Oct. 13.....	15.92	11.81	11.22	74.10	.....	.....	450	16
15445	Lewis Spindler.....	.....	Kleinwanzlebener.....	Oct. 16.....	14.20	10.45	9.93	73.10	.....	.....	680	24
15525	Chris. Weizenicker.....	.....	.....	Oct. 19.....	14.45	11.20	10.64	77.50	.....	.....	490	17
15615	Robt. C. Hoffman.....	.....	.....	Oct. 20.....	13.18	9.70	9.21	73.60	.....	.....	1,160	41
15616	.....do.....	.....	Vilmorin Improved.....	Oct. 20.....	16.39	13.10	12.42	79.90	.....	.....	1,000	35
15768	Theo. Wehrmann.....	.....	.....	Oct. 23.....	14.45	10.50	9.97	73.00	.....	.....	633	22
15761	Annie Priest.....	.....	German.....	Oct. 23.....	16.67	13.55	12.87	81.30	.....	.....	500	18
15793	Thomas O'Connor.....	.....	.....	Oct. 24.....	13.35	10.78	10.15	73.90	.....	.....	763	27
16031	August Baumann.....	.....	.....	Oct. 30.....	16.39	13.40	12.74	80.70	.....	.....	460	16
16012	Jno. Fendre.....	.....	.....	Oct. 30.....	15.48	12.30	11.69	79.30	.....	.....	980	35
16041	August Baeseman.....	.....	.....	Oct. 31.....	15.37	11.10	10.55	72.30	.....	.....	640	23
16144	Fred. Baumann.....	.....	.....	Nov. 3.....	18.67	14.88	14.11	78.50	.....	.....	330	12
16146	Fred. Bahr.....	.....	Kleinwanzlebener.....	Nov. 3.....	16.17	12.70	12.07	78.50	.....	.....	770	27
	Average.....	.....	.....	.....	15.61	12.00	11.40	76.70	.....	.....	681	24
15172	Z. G. Taylor.....	Marquette.....	.....	Oct. 5.....	16.61	12.86	12.24	77.40	.....	.....	365	13

15174	do	do	do	Oct. 5	16.08	10.20	9.69	65.00	.....	.....	.....	600	21
15763	F. A. Nickel	do	Kleinwanzlebener	Oct. 23	16.37	12.75	12.11	77.90	.....	3,304	.....	420	15
16480	do	do	Vilmorin Improved	Nov. 17	17.50	16.63	16.63	86.70	.....	11.5	.....	320	11
16010	Carl Walter	do	do	Oct. 17	18.78	15.40	14.65	81.50	.....	.....	.....	40	1
	Average	do	do		17.60	13.74	13.06	78.00	.....	15.45	3,147	349	12
15805	H. L. Moore	Milwaukee	do	Oct. 12	16.98	11.97	11.37	70.40	.....	19.8	2,859	430	15
15496	C. A. Voetz	Monroe	do	Oct. 17	15.59	12.91	12.27	82.30	.....	.....	.....	730	26
15528	Wm. H. Schmitz	do	do	Oct. 19	14.55	10.95	10.40	73.30	.....	.....	.....	1,643	58
15662	August Boethler	do	Yellow	Oct. 21	14.51	9.45	8.98	67.20	.....	.....	.....	703	25
15717	Edwin G. Kinne	do	do	Oct. 22	14.58	10.30	9.79	70.70	.....	.....	.....	580	20
15718	R. Drowatzky	do	Kleinwanzlebener	Oct. 22	14.58	10.95	10.40	75.10	.....	17	2,449	830	30
15719	Andrew Scott	do	do	Oct. 22	15.39	13.00	12.35	84.50	.....	.....	.....	1,330	47
15795	Samuel C. Smith	do	Vilmorin Improved	Oct. 24	15.97	13.25	12.59	82.80	.....	.....	.....	1,800	28
15796	Aug. Schlaver, sr.	do	Kleinwanzlebener	Oct. 24	15.14	11.65	11.06	76.80	.....	.....	.....	1,020	36
15858	Roswell Smith	do	do	Oct. 26	15.35	12.15	11.54	79.10	.....	.....	.....	1,007	36
15910	L. D. Wyatt	do	do	Oct. 27	15.20	10.80	10.26	70.90	.....	.....	.....	1,780	28
15913	J. K. Davis	do	do	Oct. 27	14.72	9.35	8.88	63.50	.....	.....	.....	610	22
16007	A. G. Aylesworth	do	Imperial	Oct. 30	15.59	13.25	12.59	84.80	.....	.....	.....	630	20
16593	William Chard	do	do	Nov. 29	18.17	16.75	15.92	92.10	.....	.....	.....	560	22
16040	F. A. Meissner	do	do	Oct. 30	17.37	14.45	13.73	82.60	.....	.....	.....	390	14
15673	Ferd. Kemnow	do	White	Oct. 21	17.43	14.60	13.87	83.80	.....	.....	.....	773	27
	Average	do	do		15.61	12.25	11.64	78.10	.....	17	2,449	827	29
15225	Wm. E. Volk	Oconto	do	Oct. 8	17.09	13.26	12.60	77.60	.....	.....	.....	765	27
15297	do	do	do	Oct. 9	17.03	13.37	12.76	78.60	.....	.....	.....	650	23
15429	J. S. Harvey	do	do	Oct. 12	17.03	9.74	9.25	70.00	.....	.....	.....	740	26
15355	James Bedore, sr.	do	German	Oct. 16	13.68	12.10	11.50	77.20	.....	.....	.....	1,090	39
15550	James Bedore, jr.	do	White	Oct. 19	14.85	10.80	10.06	72.80	.....	.....	.....	913	32
15551	E. J. Martindale	do	do	Oct. 19	14.97	12.70	12.06	84.90	.....	.....	.....	1,053	37
15708	J. V. Bierman	do	German	Oct. 22	16.69	14.65	13.92	81.90	.....	.....	.....	870	31
15722	A. W. Boettcher	do	do	Oct. 22	12.48	9.70	9.22	77.70	.....	.....	.....	530	19
15792	Jno. A. Schweiberg	do	Vilmorin	Oct. 24	17.77	15.00	14.25	84.30	.....	23.9	5,181	675	24
15500	Joseph Wothier	do	White	Nov. 19	17.23	12.65	12.02	69.80	.....	.....	.....	1,307	46
15660	Albert Krehmet	do	do	Oct. 21	10.91	7.30	6.94	66.90	.....	.....	.....	1,550	55
	Average	do	do		15.34	12.00	11.41	77.50	.....	23.9	5,181	908	32
15025	Jno. H. McGillan	Outagamie	German	Sept. 17	16.93	13.66	12.69	80.60	.....	21.78	4,112	370	13
15046	do	do	French	Sept. 17	18.33	15.50	14.72	84.60	.....	21.78	4,892	310	11
15259	W. D. Barnes	do	Kleinwanzlebener	Oct. 10	15.28	10.44	9.92	68.10	.....	.....	.....	480	17
15295	M. H. True	do	do	Oct. 12	13.78	10.44	9.92	75.70	.....	9.80	1,327	680	24
15341	D. M. Torrey	do	do	Oct. 13	14.02	10.06	9.66	71.90	.....	.....	.....	690	24
15481	Ed. Gardner	do	do	Oct. 17	15.28	11.16	10.60	73.00	.....	.....	.....	1,310	46
15483	Jno. Schwartz	do	French	Oct. 17	17.09	13.17	12.70	78.20	.....	.....	.....	510	18
15484	do	do	German	Oct. 17	17.69	13.39	12.72	75.70	.....	.....	.....	500	18
15486	Antoni Becker	do	Kleinwanzlebener	Oct. 17	15.69	12.37	11.75	78.80	.....	.....	.....	1,740	66
15494	Jno. F. Hinz	do	do	Oct. 17	12.58	9.59	9.11	76.20	.....	.....	.....	513	18

15914	Geo. Tragesen	do	Oct. 27	14.92	11.15	10.59	74.80	380	13
16213	Gustavus Hoffman	do	Nov. 6	13.28	8.35	8.03	62.90	1,730	61
16075	Edward Young	do	Nov. 2	13.01	14.10	13.40	76.40	380	13
	Average			14.31	10.48	9.98	72.43	2,209	25
13859	John Sparker	Racine	Oct. 26	16.77	13.35	12.08	79.60	533	19
15967	Adam Apple	do	Oct. 29	16.83	13.20	12.54	78.40	1,067	38
16501	W. J. Hausche	do	Nov. 19	19.50	15.50	14.73	79.40	533	19
	Average			17.70	14.02	13.32	79.13	711	25
15442	C. E. Jaquish	Richland	Oct. 16	14.28	10.28	9.77	72.00	1,160	41
15492	C. M. Porter	do	Oct. 17	16.09	12.29	11.68	76.40	1,027	36
15534	Gardner Walls	do	Oct. 19	15.07	12.70	12.09	84.30	520	18
15711	J. M. Clark	do	Oct. 22	15.08	11.55	10.98	81.90	877	31
16143	Edwin Roberts	do	Nov. 3	16.27	12.70	12.07	78.10	470	17
16187	W. T. Cass	do	Nov. 5	15.83	12.20	11.59	77.00	320	11
16543	Geo. A. Carswell	do	Nov. 23	15.91	12.00	11.40	75.5	700	25
	Average			15.36	11.96	11.37	77.89	725	26
15160	A. Austin	Rock	Oct. 3	13.97	10.12	9.61	72.30	2,810	99
15169	do	do	Oct. 5	13.98	9.17	8.71	70.10	2,030	72
15179	Edwin Hubbell	do	Oct. 6	12.55	8.05	7.66	65.70	750	26
15210	F. D. Reed	do	Oct. 8	13.08	10.51	9.99	67.00	390	14
15211	Edwin Hubbell	do	Oct. 8	13.08	11.75	11.16	78.30	620	22
15296	E. L. Bingham	do	Oct. 12	13.08	10.05	9.64	76.70	480	17
15491	John Tinker	do	Oct. 17	15.19	12.94	12.33	85.20	383	14
15522	Josiah Wadsworth	do	Oct. 19	16.65	11.40	10.83	68.50	700	25
15661	N. A. Austin	do	Oct. 21	16.23	11.40	13.68	88.70	660	23
15666	Ang. Schumann	do	Oct. 21	15.21	11.10	10.55	73.00	917	32
15797	David Walsh	do	Oct. 24	16.17	13.00	12.35	83.90	680	24
16009	W. H. Greenman	do	Oct. 30	17.09	13.00	12.35	76.00	1,140	40
16078	Jho. Kimball	do	Nov. 2	16.81	12.75	12.11	77.90	470	17
16215	Geo. B. Mackey	do	Nov. 6	17.89	13.75	13.06	76.90	300	10
16265	C. J. Capman	do	Nov. 9	14.75	10.40	9.88	70.50	1,400	49
16582	E. D. Wheeler	do	Nov. 21	17.49	14.15	13.44	80.90	680	24
16448	Geo. W. Dawson	do	Nov. 16	16.37	13.00	12.35	79.40	466	17
	Average			15.47	11.74	11.16	75.90	875	31
15128	S. A. Raymond	St. Croix	Oct. 15	16.99	12.83	12.19	75.50	845	30
15537	G. F. Hanson	do	Oct. 19	14.85	10.70	10.17	72.10	520	18
15344	Clark Greenfield	do	Oct. 19	13.65	9.10	8.65	69.70	1,930	68
15909	George Martin	do	Oct. 27	13.20	8.40	7.97	63.50	1,390	49
16008	Robert Searle	do	Oct. 30	16.38	11.60	11.02	70.00	617	22
16477	Peter L. Larsen	do	Nov. 17	23.08	17.60	16.52	76.30	420	13
15524	William Hennessy	do	Oct. 19	16.77	13.05	12.40	77.80	337	12
	Average			16.36	11.90	11.27	72.10	866	31

Summary of results by States and counties—Continued.

WISCONSIN—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
15390	Adolf Kraft.	Sank		Oct. 15	15.75	Per ct. 10.59	Per ct. 10.05	Per ct. 67.20				16
15843	William H. Schutte.	do	Kleinwanzlebener	Oct. 26	15.95	11.40	10.83	75.80				457
16184	H. J. Farum	do	do	Nov. 5	18.97	14.08	13.37	79.30	22.9	4,610	750	34
	Average				16.49	12.02	11.42	74.10	22.9	4,610	727	26
15333	Albert Ayres.	Sawyer		Oct. 13	14.02	10.49	9.96	74.90				25
15185	William McCoy	Shawano	Vilmorin Improved.	Oct. 6	18.77	14.56	13.82	77.50	22.4	4,332	1020	36
15256	Albert Builder	do		Oct. 10	18.09	14.06	13.46	78.00				20
15386	Felix Barth.	do		Oct. 13	17.67	14.68	13.94	83.10				19
15438	J. C. Koper	do	German	Oct. 16	14.58	10.93	10.38	73.00				31
15541	Gustav Thomas	do		Oct. 19	13.63	9.30	8.84	68.10				34
15697	A. C. McCully	do	Vilmorin	Oct. 21	17.79	14.25	13.48	80.20				36
16071	W. H. Carpenter	do	Imperial	Nov. 2	15.89	12.40	11.78	78.00	17.6	2,918	1,010	17
16180	John H. Campbell	do	German	Nov. 5	20.07	15.90	15.11	79.20				20
16594	T. S. McMurray	do	do	Nov. 29	27.29	22.50	21.37	82.40				8
16271	L. S. Rouse	do	Kleinwanzlebener	Nov. 9	15.95	11.30	10.74	70.80				23
	Average				17.98	13.99	13.29	77.20	20.0	3,625	660	23
15444	Plymouth Farmers' Club	Sheboygan	Kleinwanzlebener	Oct. 16	16.58	11.46	10.89	69.10				15
15716	N. W. Ingartner	do		Oct. 22	12.63	9.30	8.84	73.30				64
15720	Mrs. Laycock	do	German	Oct. 22	15.28	12.00	11.40	78.60				39
15842	A. F. Hyatt	do		Oct. 26	14.55	11.40	10.83	78.40				39
16240	George Pieper	do	Kleinwanzlebener	Nov. 7	19.39	16.45	15.63	84.90				38
15317	H. M. Groeneveld	do		Oct. 19	13.35	8.35	8.48	67.00				18
16266	Peter Doane	do	French	Nov. 9	13.65	10.40	9.88	65.50				26
	Average				15.35	11.42	10.85	75.30				33
15261	George Hartung	Taylor		Oct. 10	18.69	15.95	15.15	85.30				11
15303	Fred Moser	do		Oct. 12	15.28	10.76	10.22	70.00				19
15335	F. Lindow	do		Oct. 13	16.42	12.24	11.63	74.60				25
15343	Franz Helwig	do		Oct. 13	12.12	8.84	8.40	73.00				18
15497	F. H. Wellmann.	do		Oct. 17	15.08	10.94	10.49	72.50				23
15531	J. Reinolt	do		Oct. 19	15.85	11.80	11.21	74.40				16
15538	J. Frank	do	Kleinwanzlebener	Oct. 19	15.57	13.05	12.40	83.80				15
15540	Karl F. Hanel.	do		Oct. 19	15.47	12.50	11.88	80.80				17

15701	F. L. Dietrich	do	Oct. 22	13.18	9.00	8.55	87.30	1,080	38
15703	do	do	Oct. 22	13.38	9.65	9.18	72.10	1,050	37
15805	Fred. Willner	do	Oct. 24	11.60	11.02	11.02	78.10	637	22
15904	George Schultart	do	Oct. 23	15.63	12.20	11.59	78.10	730	26
16087	Thomas Brehm	do	Nov. 2	15.39	11.15	10.59	71.50	1,230	43
16329	Fred. Hochfeldt	do	Nov. 10	17.69	14.00	13.30	79.10	675	24
15332	Jos. Erben	do	Oct. 13	15.62	12.31	11.70	78.90	690	21
	Average			15.36	11.73	11.15	76.00	671	24
15226	M. J. Warner	Trempealeau	Oct. 9	15.83	12.24	11.62	77.30	490	17
15227	do	do	Oct. 9	15.50	11.45	10.88	73.90	520	18
15229	Robert Warner	White	Oct. 9	16.53	12.59	11.96	76.30	520	18
15212	Thomas Matchie	German	Oct. 9	12.03	7.91	7.50	65.90	1,330	47
15253	do	do	Oct. 9	11.28	7.38	7.01	65.30	1,040	37
15754	B. Tollefson	do	Oct. 23	16.97	13.20	12.54	77.80	755	27
16079	Peter H. Claussen	do	Nov. 2	18.31	14.75	14.01	80.60	285	10
	Average			15.21	11.36	10.79	73.90	706	25
15435	A. H. Rolfe	German	Oct. 16	13.08	9.23	8.77	70.60	987	35
15532	J. B. Johnson	do	Oct. 19	13.65	10.40	9.88	76.20	693	24
15627	P. M. Randall	do	Oct. 20	16.08	12.00	11.40	74.60	710	25
15663	James P. Riley	Kleinwanzlebener	Oct. 21	13.41	9.65	9.17	72.00	1,095	39
15605	M. F. Hopkins	do	Oct. 21	18.73	13.04	14.13	82.20	470	17
15706	F. C. Clark	do	Oct. 22	13.39	13.55	12.87	88.00	815	29
15707	Harry Clark	do	Oct. 22	16.39	14.01	13.40	85.00	525	29
16207	F. H. Buchanan	do	Nov. 9	16.77	13.30	12.64	79.30	773	27
16068	Adam Newland	do	Nov. 2	15.09	10.05	9.55	66.60	1,300	46
16077	Edgar Ene	do	Nov. 2	16.81	13.75	13.06	81.80	420	15
	Average			15.56	12.10	11.49	77.60	779	29
15480	J. B. Smith	Walworth	Oct. 17	15.78	11.67	11.09	74.00	530	19
15490	William Zohrlaut	do	Oct. 17	14.58	11.01	10.46	75.50	1,060	37
15543	Chas. V. Weeks	do	Oct. 19	14.35	10.80	10.26	75.30	1,140	40
15612	William McDonald	do	Oct. 20	15.58	11.50	10.93	73.80	1,270	45
15757	H. H. Wade	do	Oct. 23	15.35	11.90	11.30	77.50	967	34
16076	H. Larson	do	Nov. 2	19.61	15.75	14.96	80.30	480	17
16209	Bert Lester	do	Nov. 9	15.95	11.30	10.74	70.90	1,050	37
16394	A. W. Arwood	German	Nov. 14	17.87	14.55	13.82	81.40	473	17
15753	M. J. Bagley	do	Oct. 23	14.75	8.40	6.80	57.00	1,177	42
	Average			15.98	11.88	11.15	74.00	905	32
15554	Andrew Dahlstrom	Washburn	Oct. 19	13.95	11.35	10.78	81.40	250	9
15436	Sam Salter	Washington	Oct. 16	13.58	9.82	9.33	72.30	1,550	58
15629	William Row	do	Oct. 20	15.28	10.20	9.69	66.80	985	32
15626	A. R. Mtinger	do	Oct. 20	15.28	11.00	10.45	72.00	973	34
16183	William Meier	do	Nov. 5	18.97	14.30	13.59	73.30	500	20
16320	F. Van Rhieneu	do	Nov. 10	20.49	18.80	17.86	91.80	640	23
16321	do	do	Nov. 10	19.47	17.20	16.34	88.30	587	21

Summary of results by States and counties—Continued.

WISCONSIN—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
16322	John Gebhardt	Washington	German.	Nov. 10	19.17	Per ct. 15.50	Per ct. 14.73	Per ct. 80.90	Tons.	Pounds.	617	22
16323	do	do	French	Nov. 10	17.47	12.85	12.21	72.70	147	16	863	16
16326	George Gebhardt	do	German	Nov. 10	17.67	13.20	12.54	75.60	31	31	863	31
16327	do	do	French	Nov. 10	17.37	13.25	12.59	76.30	600	21	677	21
15962	M. L. Barney	do	German.	Oct. 29	17.63	13.20	12.54	77.50	24	24	677	24
	Average				17.43	13.57	12.90	77.23	13.1	1,597	773	27
15180	John E. Hughes	Waukesha		Oct. 16	12.95	9.23	8.77	71.70			950	34
15213	do	do		Oct. 8	14.88	10.53	10.05	71.10			950	34
15518	S. A. Baird	do	Imperial	Oct. 19	14.05	8.65	8.22	61.60			1,483	52
15520	H. T. Jeffrey	do		Oct. 19	14.65	10.35	9.83	70.70			947	33
15699	Walter D. Anstey	do		Oct. 22	12.18	8.10	7.70	66.90			1,153	41
15856	James Bias	do	Kleinwanzlebener	Oct. 26	15.97	13.20	12.54	82.70			937	33
16066	A. J. Fraser	do		Nov. 2	16.81	13.00	12.35	77.40			1,300	46
16268	Frank Peardon	do	Kleinwanzlebener	Nov. 9	18.15	12.30	11.69	67.80			570	20
16401	J. J. Frincey	do	do	Nov. 14	17.57	13.35	12.68	76.00			690	24
15841	Magnus Andrew	do		Oct. 26	14.77	14.10	13.40	79.30			890	31
15944	W. C. De Wolf	do	Kleinwanzlebener	Oct. 28	15.85	13.65	12.92	86.10			950	34
15932	John Wright	do		Oct. 20	14.48	9.85	9.56	68.00			1,330	44
15914	Geo. W. Bancroft	do		Oct. 20	17.79	14.65	13.92	82.40			720	26
16224	J. Geif	do	German	Nov. 10	16.55	11.90	11.31	71.90			657	23
16225	do	do	French	Nov. 10	17.15	11.70	11.12	68.20			623	22
	Average				15.79	11.64	11.07	73.40			943	33
15299	P. L. Van Epps	Waupaca		Oct. 12	15.28	11.56	10.97	75.50			910	32
15531	Aug. Kussmanit	do		Oct. 13	13.93	10.49	9.96	74.90			1,020	36
15548	Fred Rohman	do		Oct. 19	14.85	11.70	11.11	78.80			220	8
15553	F. E. Koeller	do	White	Oct. 19	15.87	12.45	11.82	78.50			910	32
15625	H. W. Kirkholter	do	German	Oct. 20	14.28	10.50	9.98	73.50			517	18
15755	George Williams	do		Oct. 23	15.05	11.40	10.83	75.80	15.4	2,281	377	13
15755	H. J. Leed	do	German	Oct. 24	17.27	14.40	13.68	83.20			733	26
15800	August Pidde	do		Oct. 29	15.53	11.75	11.16	75.70			1,290	40
15961	R. H. Hall	do	German	Oct. 31	17.17	14.15	13.44	82.40			500	18
16038	Daniel Marshall	do		Nov. 2	16.49	11.75	11.16	70.90			1,000	35
16067	William Bruchner	do	Imperial	Nov. 2	17.31	13.00	12.35	75.10			480	17

Summary of results by States and counties—Continued.

WYOMING—Continued.

Serial No.	Name of grower.	County.	Variety.	Date received.	Total solids.	Sucrose in—		Purity.	Yield beets per acre.	Probable yield sucrose per acre.	Average weight of beets.	
						Juice.	Beet.				Pounds.	Ounces.
15746	J. D. Parker	Carbon .....	.....	Oct. 22	15.38	Per ct. 12.00	Per ct. 11.40	Per ct. 77.9	Tons. 13.5	Pounds. 2,163	Grams. 320	10
15370	Thomas A. Dunn	Crook	French	Oct. 13	15.32	11.86	11.27	77.5	.....	.....	730	26
15061	C. E. Lincoln .....	.....do.....	Vilmorin	Oct. 31	19.77	14.00	13.30	70.8	18.7	3,677	470	17
16062	.....do.....	.....do.....	Kleinwanzlebener	Oct. 31	21.47	15.75	14.96	73.3	18.7	3,700	480	17
	Average .....	.....	.....	.....	18.85	13.87	13.18	73.9	18.7	3,689	560	20
15689	J. S. Meyer	Fremont .....	.....	Oct. 21	16.73	13.50	12.83	80.7	18.9	3,456	425	15
15690	Simeon Morgridge	Johnson	French	Oct. 21	18.13	14.00	13.30	77.2	.....	.....	625	22
15658	Wheatland Exp. Farm.	Laramie	German	Oct. 20	16.99	13.7	13.02	80.7	20.5	3,887	240	9
15074	R. M. Walker .....	.....do.....	French	Sept. 23	13.61	9.87	9.38	72.5	.....	.....	1,155	41
16165	A. C. Hubbard .....	.....do.....	Vilmorin	Nov. 4	19.44	15.00	14.25	77.2	13.9	2,761	245	9
16166	.....do.....	.....do.....	Kleinwanzlebener	Nov. 4	19.24	13.50	12.83	70.2	11.5	1,868	275	10
	Average .....	.....	.....	.....	17.32	13.02	12.37	75.2	15.3	2,839	479	17
15383	Geo. A. Becker	Sheridan .....	.....	Oct. 14	18.17	14.54	13.81	80.0	10.7	2,135	180	6
	Average of State .....	.....	.....	.....	18.18	14.19	13.48	78.1	11.1	2,130	369	12

NOTES ON THE ANALYSES OF BEETS FROM THE DIFFERENT STATES AND TERRITORIES.

Arizona.—Only two samples were received from this Territory. They were both very much overgrown, being about three times as large as the normal beet should be. As would be expected the content of sugar was very low, the average of the two samples being 7.69 per cent.

Arkansas.—Only two samples were received from this State. In the first one the beets were of a normal size, weighing 18 ounces, nevertheless the content of sugar was very low. In the second the beets were very much overgrown, averaging 62 ounces.

California.—Eight samples were received from this State. The average size of the beets was entirely too large, being 48 ounces. The average percentage of sugar in the various samples was 11.06. The highest percentage of sugar was 13.35, with a beet weighing 23 ounces, and the lowest was 8.35 in a beet weighing 62 ounces. The average yield per acre as reported was 14.2 tons, showing a theoretical yield of sugar of 2,188 pounds.

Colorado.—The number of samples from this State was forty-seven, representing ten counties. The average percentage of sugar as found in the samples was 13.08, and the average weight of the beets 26 ounces. Some of the samples gave phenomenally high percentages of sugar; especially is that true of the samples from Yuma County, which, however, were very much undergrown, averaging only 6 ounces. The county making the best showing, all things considered, is Arapahoe, where the average content of sugar in the beet was 14.27, and the average weight of the beet 21 ounces. No better agricultural result than this could be desired, in so far as the size of the beet and the content of sugar are concerned.

Connecticut.—Five samples were received from the State of Connecticut. The mean content of sugar was 10.77, and the average weight of the beets 27 ounces.

Georgia.—Two samples were received from the State of Georgia, both from Clarke County. The average content of sugar in the two samples was 11.03, and the average weight of the beets 12 ounces.

Idaho.—One sample was received from Idaho; it had a content of sugar of 12.73, and a weight of 15 ounces.

Illinois.—Thirty-six samples were received from the State of Illinois, representing fourteen counties. The average content of sugar was 11.73, and the average weight of the beet was 32 ounces. The best showing among the counties was made by Lee, which showed an average content of 13.61 of sugar in the beet, and an average weight of beet of 34 ounces. This is a remarkably high content of sugar considering the size of the beet produced. All the samples from this county showed high results. Another county showing excellent results was Cook, where the average content of sugar was 13.48 and the average weight of beet 44 ounces. It is very rare to see so high a sugar content with a beet of such size.

Indiana.—Seventy-one samples were received from the State of Indiana, representing eighteen counties. The average content of sugar for the samples for the whole of the State was 11.64, and the average weight of the beets 27 ounces. Among the counties Wabash has the best results, showing 13.45 per cent of sugar in the beet, with an average weight of 30 ounces. All the samples except one received from that county showed good results. The highest sugar was 13.58, obtained in Clinton County, from which, however, only two samples were received. This would make it rather unfair to compare it with the other counties sending a larger number of samples. Kosciusko County also made a good showing, with an average percentage of 11.93 of sugar in the beet, from 16 samples, being the largest number received from any one county in the State.

WORK CONDUCTED BY THE AGRICULTURAL EXPERIMENT STATION OF INDIANA.

Prof. H. A. Huston, chemist of the Experiment Station of Indiana, conducted an extensive series of experiments with sugar beets during the season of 1891, the results of which are printed in Bulletin No. 39 for April, 1892.

A large number of samples of seeds was sent to farmers in different parts of the State and 65 samples of beets were sent in for examination. The mean percentage of sugar in the juice of the beets and their mean average weight in ounces are as follows:

Sugar in the juice, per cent.....	12.8
Weight of beets, ounces.....	20.7

Sixty-six samples of beets grown on the experimental farm of the station were also examined and found to contain 12.4 per cent of sugar in the juice. The average weight of the beets is not given in these samples, with the exception of six, and so no comparison can be made.

As a result of the experiments it is concluded that the station will be justified in making tests in all parts of the State so that all the different characteristics of the soil in the State can be thoroughly studied with reference to the character of beets which can be grown upon it.

A table is given of the relative amount of sugar in three typical sizes of beets:

Fifteen large beets weighing 40 pounds contained 4 pounds and 4 ounces of sugar,

Thirty-nine beets of medium size weighing 40 pounds contained 4 pounds and 14 ounces of sugar,

Ninety-six small beets weighing 40 pounds contained 5 pounds and 10 ounces of sugar.

A table is also given showing the influence on the size of the beets and the amount of sugar present in them from planting at different seasons.

In the summary it is said that the results of the last year certainly justifies the station to continue the experiments with sugar beets in Indiana, and are favorable to the establishment of a beet-sugar industry in the State. There seems to be little doubt that beets with a good percentage of sugar and with sufficiently pure juice can be grown. The fertility of Indiana lands is well enough known to insure an abundant yield when proper methods of cultivation are followed. The geographical location of the State; its position in the center of a group of large markets; its cheap fuel, gas, petroleum, and coal; its relatively pure waters; its highly efficient transportation facilities by land and water, all favor the introduction of the industry.

A valuable report on diseases affecting the sugar beet is introduced by Prof. J. C. Arthur and Miss Katherine E. Golden.

Iowa.—Three hundred and twenty-two samples were received from the State of Iowa, representing sixty-one counties. The mean content of sugar in the samples was 11.82 and the mean weight of the beets 30 ounces. From Marshall County were received thirty-four samples, showing an average content of 11.54 of sugar in the beet and an average weight of 21 ounces. From Muscatine County were received thirty-three samples, showing 14.10 per cent of sugar in the beet and an average weight of 26 ounces. This is a magnificent showing, and indicates that in this county the beets must have been cultivated in accordance with the directions sent, or that the soil of the county is especially suited to the growth of the sugar beet. There is only one sample among the whole number that can be considered as poor, while many of them are above the average in richness. It can not be that, among so many samples, good results are due to accident. Thirty-one samples were received from Scott County, showing an average of sugar in the beet of 12.63 and an average weight of 29 ounces. This is also a most encouraging result. Nineteen samples were received from Dallas County, showing an average of 11.96 of sugar in the beet and an average weight of 23 ounces. This is also an encouraging result. Eighteen samples were received from Allamakee County, showing an average content of sugar in the beet of 12.64, and an average weight of beet of 40 ounces. This must also be regarded as a high content of sugar, considering the excessive size of the beets. The above comprises all the counties sending a large number of samples. Many of the counties sending a smaller number of samples show excellent results, but of course the greater reliance must be placed on those counties from which the larger number of samples was received.

It will be interesting to compare these results with those obtained at the experiment station at Ames. This institution distributed large quantities of seed, received chiefly from the Department of Agriculture, and had samples sent directly to the laboratory at the station for examination, where they were analyzed by Prof. G. E. Patrick. Experi-

ments were made upon the station grounds with different varieties, which yielded the following results:

No.	Date of planting.	Variety.	Soil conditions.	Yield per acre in tons.	No. of beets in sample taken Sept. 30.	Mean weight.	Percentage of sugar in beets.	Purity of juice.	No. of beets in sample taken Oct. 12.	Mean weight.	Percentage of sugar in beets.	Purity of juice.
1	Apr. 15	German	Upland sandy loam	28.163	10	oz. 16.7	14.62	77.7	11	oz. 27.5	11.49	75.3
2	May 25	French	Low rich loam	21.28	12	20.0	12.19	72.5	15	16.0	12.19	75.5
3	May 25	do	Medium sand loam	24	14	12.5	13.02	75.5	15	10.0	12.13	75.2
4	May 9	do	Low rich loam	25.76	10	36.5	11.09	72.1	8	37.5	11.32	73.5
5	May 13	do	Timber clay loam	17.6	12	12.5	14.47	80.1	15	12.5	13.80	78.3
6	May 13	German	do	15.86	13	11.5	15.73	78.3	11	11.0	14.12	80.1
7	May 20	do	Same as No. 1 and lime.	18.5	11	20.0	11.87	70.4	12	12.0	12.89	76.9
8	May 20	do	Same as No. 1 and sugar fertilizer.	18.3	11	15.5	13.15	76.0	9	10.0	13.02	73.8
9	May 20	do	Same as No. 1 and vegetable fertilizer.	19.1	12	12.0	14.21	76.2	13	15.5	11.72	70.8
10	May 25	do	Same as No. 1, subsoiled.	19.36	12	16.0	13.45	75.8	12	10.5	13.46	77.3
11	May 13	French	Stiff timber clay	8.5	12	9.0	15.41	51.0	11	9.5	14.29	78.2
12	May 13	Desprez	Timber clay loam	12.32	13	11.5	15.71	82.5	10	12.5	15.05	85.4

No.	Date of planting.	Variety.	Soil conditions.	No. of beets in sample taken Nov. 6.	Mean weight	Percentage of sugar in beets.	Purity of juice.	Average per cent of sugar in beets.	Average purity of juice.
1	Apr. 15	German	Upland sandy loam	10	oz. 20.5	12.77	74.3	12.96	75.7
2	May 25	French	Low rich loam	15	15.5	12.72	74.0	12.36	74.0
3	May 25	do	Medium sand loam	13	14.5	13.44	76.6	12.86	75.4
4	May 9	do	Low rich loam	11	55.0	12.17	72.8	11.52	72.8
5	May 13	do	Timber clay loam	18	11.0	14.65	76.9	14.30	78.4
6	May 13	German	do	17	14.5	14.29	76.7	14.71	78.3
7	May 20	do	Same as No. 1 and lime	14	15.5	13.46	73.5	12.74	73.6
8	May 20	do	Same as No. 1 and sugar fertilizer.	10	11.0	14.62	71.9	13.59	73.5
9	May 20	do	Same as No. 1 and vegetable fertilizer.	13	12.5	13.66	72.1	13.19	73.0
10	May 25	do	Same as No. 1, subsoiled	14	9.0	15.92	73.9	14.27	77.0
11	May 13	French	Stiff timber clay	12	9.0	14.84	79.0	14.84	79.4
12	May 13	Desprez	Timber clay loam	14	14.0	15.17	79.1	15.31	82.3

The experiment station field consisted of 1.3 acres. The cost of cultivation and harvesting was \$51.25, or at the rate of \$39.42 per acre.

The beets were grown in rows 23 inches from center to center and the plants were thinned to 8 inches apart in the rows. The chief conclusions drawn from the experimental work at the station were as follows:

- (1) Early planting gave the greatest tonnage and the most sugar per acre.
- (2) Very large beets did not sugar well.
- (3) Subsoiling gave the best-shaped beets and the highest per cent of sugar in November, needing the least trimming.
- (4) Cutworms destroyed most of our early plantings, but did not affect the later plantings.

(5) Per cent of sugar was affected by second growth in October or by absorbing moisture from the rains after long drouth, or both.

(6) Yield per acre has much to do with the profitableness of the crop; and

(7) While our highest analysis came from beets averaging 13 ounces, trimmed, and yielding 12.32 tons per acre, our largest yield of sugar per acre came from beets averaging 21 ounces, trimmed, and yielding 28.163 tons per acre.

(8) Clay soil gave us the highest per cent of sugar and comparatively higher purity and the lowest tonnage per acre.

(9) Three plats fertilized with lime, nitrogen, phosphoric acid, and potash, gave no evident benefit.

(10) The average per cent of sugar was 14.14, and the average yield about 20 tons an acre, and the cost of growing and harvesting \$39.42 an acre. The highest sugar in beets, per acre, was 7.299 pounds.

The foregoing comments on the work were taken from the bulletin of the station No. 15. From the same bulletin, also, the following extracts are taken, relating to the experiments made by the farmers in the different parts of the State of Iowa.

In all 502 samples were received, and fifty-one counties were represented. The average percentages of sugar in the beets as analyzed at the Iowa Experiment Station laboratory, were as follows:

County.	Per-centage.	County.	Per-centage.
Dickinson	12. 89	Mitchell	12. 10
Allamakee	12. 13	Chickasaw	13. 21
Plymouth	10. 29	Buena Vista	10. 34
Pocahontas	8. 89	Wright	13. 22
Fayette	12. 45	Clayton	11. 80
Ida	9. 50	Sac	9. 94
Webster	11. 04	Hamilton	11. 31
Hardin	11. 77	Grundy	11. 76
Black Hawk	11. 03	Carroll	12. 08
Greene	9. 73	Boone	9. 58
Story	10. 57	Linn	10. 76
Shelby	8. 32	Guthrie	6. 91
Dallas	11. 57	Polk	11. 35
Jasper	10. 82	Warren	10. 89
Marion	10. 54	Poweshiek	11. 89
Cedar	11. 50	Scott	13. 44
Cass	10. 50	Warren	11. 53
Mahaska	7. 65	Keokuk	8. 87
Montgomery	9. 26	Adams	12. 20
Union	12. 04	Page	9. 74
Taylor	12. 98	Decatur	7. 51

On account of the large number of samples received from Muscatine County the analyses are divided into three groups. The first group contained 53 samples and had a mean percentage of sugar in the beet of 11.96. The second group contained 61 samples and had a mean percentage of sugar in the beet of 12.29. The third group contained 96 samples and contained a mean percentage of 13.64 of sugar in the beet. This is also a remarkable showing, and corresponds with the results obtained on the beets from this county analyzed in the laboratory of the Department of Agriculture, where 31 samples showed an average of 14.11 per cent of sugar. Certainly no further evidence than this will be needed to convince anyone that the county of Muscatine, in Iowa,

judging at least by one season's work, is extremely well adapted to the production of sugar beets of high quality.

In regard to the tables the following remarks are found in Bulletin 15:

The average results for different counties show in some instances wide differences in quality of the beets. But wide differences are also found between the beets grown on different farms in the same county, and even between those of different plats or fields of the same farm. Some of these differences may be, probably are, due to the soil itself, but without doubt very many are due to the modes of preparing the soil and cultivating the crop. Therefore it is not safe to assume that the relative adaptability of the different counties to the beet-sugar industry is truly, or even approximately, represented by the results of a single year's investigation—and this is of course especially true of those counties from which but few samples were received.

It is true the results of the State as a whole do not indicate as high an average quality of beet as is reported from some States in the drier regions further west and northwest; but on the other hand the average yield of beet per acre is in Iowa very much larger than is possible in those States, without irrigation. Therefore, even should this indication regarding quality be in future verified (it is now only an indication), that difference would probably be more than balanced by the superior yield per acre possible with the soil and climate of Iowa. It is generally asserted, and doubtless with truth, that for profitable sugar manufacture there is required an average quality of beet represented by a sugar content of at least 12 per cent (on the beet) and a purity coefficient of nearly 80 or upwards. But quality of beet is not all. Plainly, the yield of beets per acre is an equally important factor in determining profit.

Kansas.—Thirty-six samples were received from the State of Kansas, representing seventeen counties. The mean results for the whole State were, sugar in the beet, 10.69, and average weight of beet, 33 ounces. The counties showing good results were Harvey, two samples averaging 3.61 of sugar in the beet, with an average weight of 22 ounces; and Edwards County, one sample with 14.8 per cent of sugar in the beet and with an average weight of 43 ounces. This is a very high result considering the size of the beet.

EXPERIMENTS WITH BEETS AT THE SORGHUM EXPERIMENT STATION, STERLING, KANSAS.

An acre and a half was planted in beets, of the Vilmorin and Kleinwanzlebener varieties. The land was plowed in the fall; in the spring it was plowed and also subsoiled to a depth of 12 inches. The seed was planted April 15, in rows 18 inches apart, at the rate of 15 pounds per acre. The expense of growing the beets, including rent of land at \$3.50 per acre, labor at \$1.50 per day, seed at 25 cents per pound, and the expense of harvesting, not including hauling the beets, was \$72.

The beets yielded 17 tons per acre of clean, topped beets. The average percentage of sugar in the beets, when harvested, was 11.97. The purity was 80. Assuming that the beets were worth \$3 per ton, the crop was worth, at a factory, \$76.50. It is believed that by planting in 30-inch rows, using a horse cultivator instead of performing all the labor by hand, and having experience in beet growing, the expense could be lessened and the profit could be increased. On this point the conclusions of the Wisconsin Experiment Station appear correct.

Kentucky.—Three samples were received from the State of Kentucky, representing two counties. The average percentage of sugar in the beets was 9.12 and the average weight of the beets 34 ounces.

Maryland.—Only two samples were received from this State, both from Prince George County. The mean content of sugar was 7.36 per cent and the mean weight of the beets 16 ounces.

Michigan.—Fifty samples were received from the State of Michigan, representing twenty-one counties. The average percentage of sugar in the beets was 12.64 and the average weight of beet 32 ounces. The results from the State are very encouraging. Allegan County leads the list of counties with a percentage of sugar in the beet of 16.34 and an average weight of beet of 20 ounces, obtained from three samples. Osceola County comes next with an average percentage of sugar in the beet of 15.40 and an average weight of beet of 25 ounces. Next comes Gratiot with four samples, with an average of 14.36 per cent of sugar in the beet and an average weight of beet of 20 ounces. The number of samples from any one county is not large, yet on the whole the results show that Michigan is particularly well adapted to the growth of sugar beets of high quality.

Extensive experiments were conducted in Michigan by Dr. R. C. Kedzie, chemist of the Agricultural Experiment Station, during the season of 1891. The results are published in Bulletin 82 of the Michigan Agricultural Experiment Station.

The tabulation of the results is made by districts. The western district, consisting of five counties, reported an average of 15 tons of beets per acre, with a sugar percentage in the juice of 14.23. The southeastern district, consisting of four counties, reported an average of 16.5 tons per acre and an average percentage of sugar in the juice of 13.52. The central district, consisting of four counties, reported an average of 13 tons per acre and 14.33 per cent of sugar in the juice. The northeastern district, consisting of three counties, reported an average of 15 tons per acre and 13.29 per cent of sugar in the juice.

Dr. Kedzie states that from the standpoint of the manufacturer the outlook is promising. An average of nearly 14 per cent of sugar and a coefficient of purity of above 80 renders the prospect of making sugar at a profit extremely flattering. He advises investors to be slow about establishing a sugar factory and to consider all the problems connected therewith before investing their money. This is certainly very good advice.

It is announced that the station will not undertake further experiments in the distribution of beet seed and the investigation of the subject of sugar-making, and this is certainly a subject of regret. With such promising results as have been obtained by Dr. Kedzie, there are certainly very good reasons for going ahead and making a thorough study of the State in regard to its sugar-producing properties.

The total number of samples examined was 229, and the mean results of the average weight, average percentage of sugar in the juice, and average coefficient of purity are as follows:

	Grams.	Ounces.
Average weight of beets.....	992.25	35
Per cent sugar in juice.....	13	79
Purity coefficient	86.30	

These results are certainly of the most encouraging character. The content of sugar is remarkably high when the overweight of the beets is taken into consideration.

Minnesota.—Forty-one samples were received from the State of Minnesota from eighteen counties. The average per cent of sugar in the beet was 12.38, average weight of 29 ounces. The county showing the

highest results was Polk, averaging 15.42 per cent of sugar in the beet and 30 ounces in weight. Next on the list comes Goodhue County with four samples, averaging 15 per cent of sugar and 20 ounces in weight. Next Faribault, with four samples, averaging 12.42 percentage of sugar and 27 ounces in weight.

Missouri.—Sixty-seven samples were received from the State of Missouri. The average percentage of sugar in the beet for the whole State was 10.42, and the average weight of beets 20 ounces. The best result is reported from Caldwell County, showing 15.41 percentage of sugar in the beet and a weight of 12 ounces. The next best result is from Knox County, four samples with an average of 13.36 per cent of sugar in the beet and an average weight of 9 ounces. This must not be considered a very high content of sugar for beets so greatly undergrown. The low result in this State as a whole is due to the belated samples sent by the State Experiment Station. These samples were not received until late in January and some of them were in a very poor condition. Especially hard on the State average are the results of Nos. 16670 and 16671, comprising samples of beets wholly unfit for any use.

Quite remarkable, however, is the result reported from Livingston County. One sample weighing 64 ounces contained 11.96 per cent of sugar. On the whole it appears that had the beets grown in Missouri been cultivated under proper scientific conditions so as to keep the size down to the normal, the content of sugar in them would have compared favorably with that of any other State.

Montana.—Forty-one samples were received from this State, representing five counties, of which Gallatin County furnished thirty. The average content of sugar for the State was 13.23, and the average weight of the beets 25 ounces. Gallatin County, with thirty samples, shows an average content of sugar in the beet of 13.75 and an average weight of beet of 20 ounces. This is certainly a most excellent result. The highest percentage in the samples is found in those from Missoula County, containing 15.82 per cent of sugar in the beet and having an average weight of 28 ounces. There were, however, only two samples from this county. The next best result is also from a county which furnished only two samples, Lewis and Clarke County, showing an average content of sugar in the beet of 15.46, and an average weight of beet of 19 ounces.

Nebraska.—The number of samples received from Nebraska was sixty-two, representing twenty-nine counties. The average content of sugar in the beet for the whole State was 11.67 and the average weight of the beet 35 ounces. Among the counties showing the highest results may be mentioned Richardson, one sample having 15.82 per cent of sugar and a weight of 13 ounces. Howard County, two samples, averaging 14.54 per cent of sugar and 24 ounces in weight. Boxbutte County sent two samples showing 16.22 per cent of sugar and an average weight of 31 ounces. Saline County, two samples, showing 14.21 per

cent of sugar and an average weight of 30 ounces. From some of the counties in Nebraska very poor samples of beets were received, and these tend to lower the average of the whole State. In many of the counties the results compare favorably with those from any part of the country.

EXPERIMENTAL WORK CONDUCTED BY THE EXPERIMENT STATION OF NEBRASKA ON
SUGAR BEETS.

Conducted by Profs. NICHOLSON and LOYD.

[Abstract of results in Bulletin 21 of the Nebraska Station.]

The work was divided into two sections, viz, the first section conducted on the experimental farm of the station, and the second section conducted by distributing seeds to various localities throughout the State and analyzing the samples received from the different growers.

Phenomenal yields were obtained on the station plats.

Plat A yielded 34 long tons per acre with a sugar content of 14.8 per cent.

Plat B yielded 31 long tons per acre with 13.0 per cent of sugar.

Plat C yielded 31.3 long tons per acre with 13.5 per cent of sugar.

Plat D yielded 30.5 long tons per acre with 14.2 per cent of sugar.

Plat E yielded 30.8 long tons per acre with 12.9 per cent of sugar.

Another series of experiments was made to test the value of agricultural implements, and a third series to determine the effect of fertilizers. Bone dust, kainit, nitrate of soda, guano, and phosphate were used singly and in mixtures without any appreciably good effect upon the sugar content or tonnage of the beets. The average yield in tons per acre from these various plats was 15.5, and the average content of sugar 13.3 per cent. The average cost per acre of the different plats harvested and placed in the silo varied from \$32.75 to \$29.14.

As a result of the whole study it was found that the newer ground not subsoiled yielded on the average about 13 tons of topped beets per acre; whilst the same ground, that had been thoroughly stirred to a depth of 16 inches, gave an average yield of nearly 16 tons to the acre; while on the older ground, that which for a long time had been under thorough cultivation, and had been thoroughly subsoiled, the average yield rose to 31.5 tons.

It was found that in rainy weather in the autumn that by loosening the beets in the row and allowing them to remain without harvesting, the sugar was preserved better than if they were not so loosened. Comparative experiments showed that with beets loosened in the row and left standing the average percentage of sugar was 13.9, while in those which had not been loosened it dropped to 12.8.

In the second series of experiments, viz, those in which seeds were sent to the farmers, eighty-eight samples were received from the farmers, the average weight of which was 22.74 ounces, and the average percentage of sugar (presumably in the juice) reported from the analyses was 13.09.

Nevada.—Eighteen samples were received from this State, from three counties of which one, Washoe, furnished fifteen. The average percentage of sugar in the beet for the State was 17.2 and the average weight of beet 11 ounces. Washoe County, which practically furnished all the samples from the State, also leads in the quality of the beets obtained. The numbers representing their quality are almost phenomenal with the exception of the average weight, which is only about what it should be. This doubtless accounts for the fact that the beets were so exceptionally rich. The fifteen samples from this county showed an

average percentage of sugar in the beet of 18.02 and an average weight of 9 ounces.

New Hampshire.—Only one sample was received from this State, which contained 11.64 per cent of sugar and weighed 19 ounces.

New Jersey.—Only one sample was received from this State, which contained 7.33 per cent of sugar, with a weight of 17 ounces.

New Mexico.—Seventeen samples were received from the Territory of New Mexico, showing an average content of sugar of 13.8 and an average weight of 28 ounces. Eddy County, which furnished the largest number of samples, also leads the list in regard to quality, showing an average of 14.45 per cent of sugar and a weight of 27 ounces. This result is exceptionally fine and shows that the possibilities of the production of beets of high saccharine richness is very flattering.

New York.—Four samples were received from the State of New York, and the average content of sugar was 11.58 and the average weight 32 ounces. Three counties sent samples. The best sample was received from Genesee County, with 13.02 percentage of sugar and a weight of 23 ounces. Erie sent two samples with an average content of sugar of 12.25 and an average weight of 33 ounces.

North Dakota.—There were received by the Department from North Dakota eleven samples from six counties. The mean percentage of sugar for the State was 11.84, and the mean weight of the beets 23 ounces. The best results by counties were from McIntosh.

Bulletin No. 5 of the Experiment Station of North Dakota, issued in February, 1892, contains an account of the results with sugar beets in that State during the season of 1891.

Seed of the standard varieties of sugar beets was distributed to different parts of the State and one hundred and forty-four samples were received for analysis. In general it may be said that the samples were somewhat overgrown, as will be seen from the average weight. The percentage of sugar in the juice and the purity are also rather low; lower than would be expected, in fact, for that locality.

Mr. E. F. Ladd, who conducted the analyses, makes the following summary of the results:

(1) The one hundred and twenty-nine samples of beets analyzed gave an average sugar content (sucrose) of 11.43 per cent.

(2) Many of the samples of beets sent for analysis were harvested before the sugar in the beets was fully formed; in other words, before the beets were ripe.

(3) In many cases the beets had not received proper treatment and much of the root grew above ground.

(4) In many instances the ground was not plowed to sufficient depth, not more than 6 inches deep, leaving a hard, impenetrable subsoil below, and the beets grew prongy and of ill shape—such as would be rejected at the factory.

(5) To grow sugar beets for the factory the land should be plowed to a depth of 8 to 10 inches; the beets grow well in the ground, for the part above ground is of inferior quality and generally rejected at the factory.

(6) The large beets are not the best for sugar. Beets weighing above 3 pounds have a less per cent of sugar than the smaller beets.

(7) For the present it is my belief that for the most of North Dakota other industries will be found more profitable for both manufacturer and farmer than the sugar-beet industry.

It will be seen from the conclusions which he reaches and which are justly based upon the analyses made, that he is not disposed to favorably consider that the sugar beet has a promising future in North Dakota. I am inclined to the opinion, however, that with more scientific methods of culture the results obtained in North Dakota will prove much more encouraging than those secured in the last year.

From the data given in the bulletin as printed the mean figures of the samples analyzed are as follows:

Average weight of beets in grams.....	822.90
Per cent sugar in juice.....	11.36
Purity coefficient	74.00

Ohio.—Sixty-six samples were received from the State of Ohio, representing twenty counties. The average content of sugar in the beets from the whole of the State was 11.33 and the average weight of the beets 31 ounces. Morrow County is best on the list with samples, showing 16.44 per cent of sugar and an average weight of 22 ounces. Hancock County furnished rich samples, four in number, averaging 16.32 per cent of sugar in the beet and 19 ounces in weight. One of the samples, No. 26614, received from Ohio, deserves special mention on account of its high content of sugar and its high purity. It contained 20.19 per cent of sugar with a purity of 87.4. Trumbull County sent six samples, with an average of sugar in the beet of 13.12 and an average weight of 25 ounces. Ashtabula County sent two samples with an average content of sugar of 13.19 and an average weight of 25 ounces. The largest part of the samples were from Erie County, which furnished eighteen, with an average content of 11.5 of sugar and having an average weight of 32 ounces. Many of the samples from Erie County were of exceptional richness, but others were as exceptionally poor, which pulled down the average to the number given.

Oklahoma.—One sample was received from the Territory of Oklahoma, very much overgrown, showing only 6.37 per cent of sugar.

Oregon.—Thirty-five samples were received from the State of Oregon, containing an average percentage of 13.8 of sugar and with an average weight of 23 ounces. Samples were received from fourteen counties. The richest sample was received from Jackson County, showing 17.99 per cent of sugar with a weight of 20 ounces. The next best results were from Clackamas County, three samples averaging 14.78 per cent of sugar with an average weight of 21 ounces; Columbia County, three samples with an average per cent of sugar of 14.56 and an average weight of 19 ounces; Coos County, five samples, showing an average of 13.83 per cent of sugar with an average weight of 30 ounces, and Lane County, six samples, showing 13.53 per cent of sugar and averaging 20 ounces in weight. The samples from Oregon are

uniformly rich in quality, and if they truly represent the capabilities of the State, there certainly is a bright future for the beet-sugar industry on that portion of the Pacific coast.

SUGAR BEETS AT OREGON EXPERIMENTAL STATION.

Experiments were conducted by the Experiment Station of Oregon during the year 1891 on the culture of sugar beets and the analysis thereof, and the results obtained are issued in Bulletin No. 17 of the Oregon Agricultural Experiment Station.

The standard varieties of sugar-beet seed were obtained and distributed to farmers in different parts of the State. A circular showing the best methods of cultivation was also sent out with the beets for the guidance of the farmers. Accompanying the report is a valuable contribution to the study of the climate and soil of the State in regard to the production of the sugar beet, and that portion of the State which is supposed to be most favorable to it is marked on a map. Tables showing the amount of rainfall in different parts of the State are also given. It is noticed that, in general, the spring rains lasted until quite late, thereby causing delay in the time of planting. Almost the whole of the planting was done in May, while in ordinary seasons a good portion of it could have been accomplished in April.

The number of samples analyzed was 95. The results are certainly encouraging and show that the sugar beet has great possibilities in the State. The report was prepared by G. W. Shaw, chemist, and Dumont Lotz, assistant chemist. In the conclusions which they draw from the analyses they state that the investigations have progressed far enough to indicate that there are sections in the State naturally adapted to the culture of the sugar beet, and these sections are noticed by shaded lines on the map. It is not suggested that the farmers should give up other crops to grow sugar beets, but that they should combine beet growing with the regular farm work.

An extended plan for experiments to be made in 1892 is also given.

The mean data from the analyses reported are as follows:

Average weight of beets in grams.....	*608.50
Per cent sucrose in juice.....	13.75
Purity coefficient.....	77.57

Pennsylvania.—Seven samples, showing an average content of 13.29 of sugar and an average weight of 22 ounces, were received. Five counties were represented. The highest result was obtained from Butler County, one sample showing 15.53 per cent of sugar and weighing 17 ounces. Lackawanna County, with two samples, showed a sugar content of 15.51 and an average weight of 18 ounces. The results from Pennsylvania are also of a most encouraging nature, although the number of samples is entirely too small to enter into a general comparison.

South Dakota.—Two hundred and two samples were received from the State of South Dakota, showing an average content of sugar of 12.45 and an average weight of 22 ounces. Forty-five counties furnished samples, of which Brown County furnished forty-nine, showing an average content of 12.76 of sugar and an average weight of 17 ounces. The county furnishing the next largest number of samples was Lake, from which twenty-nine samples were received, showing an average content of 11.04 of sugar and an average weight of 23 ounces. The richest

*Excluding one beet weighing 10 pounds.

beets received from South Dakota were from Faulk County. In general, the character of the beets from South Dakota is of a high order, the State showing remarkable facilities for producing beets of great saccharine strength.

Tennessee.—Five samples were received, showing an average content of 8.77 of sugar and an average weight of 20 ounces. The richest beet received from Tennessee was from Davidson County, and showed 14.82 per cent of sugar and weighed 11 ounces. The rest of the samples from that State were of a poor quality.

Texas.—Ten samples were received from the State of Texas, showing an average content of sugar of 10.31 and an average weight of 23 ounces. Samples were received from seven counties. The richest sample was received from Mason County, with a content of sugar of 13.92, but weighing only 5 ounces.

Virginia.—Seventy-two samples were received from the State of Virginia, of which 33 were from Augusta County and 29 from Frederick County. The average for the State is 11.12 per cent of sugar and 21 ounces the average weight. On the whole, the best results were obtained from Frederick County, with 29 samples showing 11.93 per cent of sugar in the beet and an average weight of 25 ounces. The average for Augusta County, with 33 samples, was 11.06 per cent of sugar in the beet and an average weight of 18 ounces.

Washington.—Eleven samples were received from the State of Washington, from six counties. The average content of sugar in the beets from the State was 14.47 and the average weight 18 ounces. The richest samples, two in number, were from Stevens County, showing an average of 17.51 per cent of sugar and averaging in weight only 10 ounces. The two samples from Whatcom County showed an average content of 15.70 of sugar and an average weight of 18 ounces. With the exception of two, Nos. 15263 and 15264, all the samples received from the State of Washington were of a high saccharine strength.

Wisconsin.—Four hundred and fifty-one samples were received from Wisconsin, representing sixty counties. The average content of sugar in the beets for the whole State was 11.05 and the weight of the beets 26 ounces. The richest beets were received from Ozaukee County, five samples showing an average of 13.42 per cent of sugar and averaging 17 ounces in weight. Jefferson County, with nineteen samples, showed an average content of sugar of 13.08 with an average weight of 24 ounces. One very poor sample is found in this county, viz, No. 15443. Marquette County furnished five samples with an average of 13.06 per cent of sugar and an average weight of 12 ounces. There is also one very poor sample from this county, viz, No. 15174. In general the results from Wisconsin are more reliable on account of the large number of samples which was sent. Where so many causes enter to disturb the accuracy of the data obtained, as is the case in experimental work of this kind, the greater the number of samples which can be obtained the greater the reliability of the results.

This experimental work in Wisconsin was supplemented also by an extensive series of experiments carried on by the Agricultural Experiment Station of the State, under the auspices of the Department of Agriculture. The following data give the results of these experiments:

SUGAR BEET EXPERIMENTS IN WISCONSIN IN 1891.

By F. W. WOLL.

LETTER OF TRANSMITTAL.

MADISON, Wis., *February 8, 1892.*

DEAR SIR: I transmit herewith our report of beet-sugar investigations for this State during the season of 1891.

The report shows that we distributed a thousand pounds of seed among 850 farmers in the spring. In the fall 373 sample lots of beets were received at the station grown from the seed distributed in the spring. Had not a drought of almost unknown severity prevailed during the growing season, a much larger number of farmers would have sent in samples, as we received scores of letters from parties who had received seed, stating that they had been unable to grow any beets. The results of these analyses show 7.12 as the lowest per cent of sugar, highest 23.52, the average for the 373 samples being 12.56, with an average estimated yield of beets of over 15 tons to the acre.

At this station 2 acres of beets were grown, with every prospect in the spring of marked success, as the soil was well adapted to the roots and the stand of young plants remarkably even and uniform. The drought, however, cut the yield down to a little more than 14 tons for the 2 acres. Had there been a normal amount of rainfall, the yield would have been not less than 50 tons from the same plot.

Eleven varieties were planted in the station plot. The report shows the average per cent of sucrose in the beets grown by us to have been 15.5 per cent, with 13.27 per cent and 17.56 per cent as lowest and highest limit.

Much interest has been awakened in this State by the study of the sugar-beet plant carried on by this station under your direction, and I think it would be very unfortunate if the work were dropped at this time. While some other States have gone ahead faster than Wisconsin in the establishment of beet-sugar factories, I believe we have really lost nothing in the apparent delay, for we are learning the capacity and possibilities of our soil and climate, and our farmers are gaining knowledge of the requirements essential to successful cultivation of the beet plant. We recollect the failure of two sugar-beet factories many years ago and are desirous of not repeating such results. This does not mean that the people are indifferent and lack confidence in this direction, but rather that they would move cautiously and be sure at each step of the ground occupied.

Trusting that this report may in some measure bear evidence that the confidence you have reposed in us was not misplaced, I am,

Very respectfully,

W. A. HENRY.

Hon. J. M. RUSK,
Secretary of Agriculture.

The report of the work done by this station during the year of 1891, in regard to the culture of sugar beets, will be discussed under two general headings: (1) Report of experiments at this station; and (2) report of analyses of beets from farmers in different parts of the State.

SUGAR BEETS AT THIS STATION IN 1891.

A piece of land of very nearly 2 acres was set apart in the spring for sugar beets. The plot slopes somewhat to the west, and is light clayey loam, becoming more sandy at the east end. As a consequence, the eastern portion is considerably drier and would suffer more in case of a drought, which also proved true during the past season, as the summer of 1891 was exceedingly dry. The meteorological data for this place for the months May-October, inclusive, are given in the following table. For the sake of comparison the total rainfall for the same months last year, and also the normal rainfall (average for two years) are given in the table.

*Meteorological data May to October, 1891, for Madison, Wis.**

RAINFALL IN INCHES.

Date.	Rain-fall.	Date.	Rain-fall.	Date.	Rain-fall.	Date.	Rain-fall.	Date.	Rain-fall.	Date.	Rain-fall.
May 10	<i>In.</i> 0.07	June 10	<i>In.</i> trace	July 2	<i>In.</i> 0.47	Aug. 1	<i>In.</i> .18	Sept. 2	<i>In.</i> 0.01	Oct. 6	<i>In.</i> 0.11
15	trace	16	trace	6	.98	11	.16	6	trace	7	.04
21	.10	17	.012	7	.39	14	.03	12	trace	8	.03
22	1.00	18	.03	13	.03	20	.31	28	.37	13	.07
25	.25	19	.72	21	.02	21	.02			14	.03
31	.02	21	.04	22	.01	26	.28		.38	15	trace
		26	.04	23	.14	27	.15			17	.16
	1.44	27	.04	28	.62	29	.28	Oct. 3	0.65		
		28	1.58	29	.01	30	trace	4	.40		1.49
June 1	0.71	30	.01								
2	.02				2.67		1.41				
3	.33		3.69								
5	.09										
6	.06										
				May.	June.	July.	Aug.	Sept.	Oct.	Total.	
Total rainfall, 1891				1.44	3.69	2.67	1.41	.38	1.49	11.02	
Normal rainfall				3.54	4.42	4.19	3.28	3.35	2.87	21.65	
Rainfall, 1890				5.03	7.72	1.81	4.23	2.62	4.59	25.00	

* From Observations made at Washburn Observatory.

TEMPERATURE °F.

	May.	June.	July.	Aug.	Sept.	Oct.
Maximum temperature	78.0	88.0	86.0	92.0	90.0	83.0
Minimum	32.0	44.0	48.0	46.0	35.0	19.0
Mean	56.0	67.2	66.6	68.4	67.0	45.4
Mean normal	57.8	67.2	72.7	69.4	61.0	48.5

It will be noticed that the precipitation for 1891 for the summer months was only 11.02 inches, or about half of normal and less than half of last year's, during the same months. Up to July 7 the prospects for a large yield were most promising. Between July 7 and August 26 there was not more than one good rain, and as a result the beets suffered greatly from the drought from this time on. August, September, and October all being very dry, the growth of the beets was checked, and a small yield of beets, to some extent abnormally rich in sugar, was the result. May, July, August, and October were colder than the normal, while September was considerably warmer. With a proper supply of moisture there is, however, little doubt but what a good crop of beets would have been harvested.

VARIETIES PLANTED.

The following eleven varieties were planted on May 26 and 27: Le Maire's Richest, Simon LeGrande, Vilmorin, Kleinwanzleben, Bulteau Desprez, Desprez B. & R., La Plus Riche, F. Kroemer, O. B. S. & Co., French, German. The first nine varieties were obtained from Oxhard Beet Sugar Co., Grand Island, Nebr., and the two last varieties from the United States Sugar Experiment Station at Schuyler, Nebr. In all, 183 rows were planted. The length of each row was 190.6 feet, and the distance between each row 30 inches; the seed was planted thicker than last year; after last thinning the beets stood 4 to 6 inches apart in the rows. From 14 to 22 rows were planted of each variety, these being planted in the order given above, starting from the west end of the plot. The plot was cultivated on June 10 and 11 with wheel hoe, June 15 with narrow tooth single cultivator, June 22 to 26 the plants were thinned and hoed and a horse cultivator run through the rows. At this time the plants were about 3 inches high. The horse cultivator was run through the rows again on July 2, 14, 31, and the weeds in the rows were destroyed by hand hoeing July 20 to 23 and August 1. The harvesting was done by plowing a furrow close up to the beets; after thus laying them bare they were easily pulled and thrown in a pile. After all beets were thrown in piles they were topped and drawn by team to the farm root-cellar, after having first been weighed. A basketful of each load was taken out to be washed and the per cent of dirt adhering to the beets thus obtained.

The following gives the time spent in growing the crop of beets, and also the cost, estimating the wages for a man 10 cents an hour, for man and horse 15 cents, and man and team 25 cents per hour:

Cost of growing a crop of beets from a 2-acre field.

Plowing and preparing the land (allowed).....	\$2.00
Planting and cultivating the crop:	
304 hours' time for one man	30.40
22 hours, man and horse	3.30
Harvesting and hauling the crop:	
111 hours' time for one man	11.10
28 hours for man and team	7.00
Total	53.80

From this field we obtained a little more than 14 tons of washed beets (as we shall see presently), which would make the total cost of growing and harvesting a ton of beets \$3.76, allowing the tops, which yielded more than 4 tons from the plot, to pay for rent of land, the cost of seed, and wear of machinery. Last year our beets yielded more than 20 tons per acre on an average. This yield may be considered slightly above average for good land and cultivator; but if we take 15 tons as an average yield per acre we get the cost of raising and harvesting 1 ton of sugar beets \$2.46, assuming the cost of harvesting and hauling the beets double the amount charged in the above table. The average price per ton of beets during the past season was, in Nebraska, \$3.50, in California \$4, in Utah \$4.50. With the average price of \$4 paid for the beets the net income from one acre would be \$23. Doubtless the cost of growing the crop could be considerably reduced by growing the beets on a larger scale, and by the application of machinery that will successfully pull the weeds in the rows between the beets. On the other hand, the cost of hauling the beets would be larger with a greater distance to the factory—an item that would easily swallow up all profit if the distance is too great.

EXAMINATION OF BEETS GROWN AT UNIVERSITY FARM.

The beets were sampled and analyzed September 26, 1891, and also at harvesting time, October 26. Three beets were selected for analysis, washed and dried, a quarter section of each beet cut and grated together, the pulp put in a bag, and the

juice pressed out. The specific gravity of this was then observed, and the clarified juice polarized. At harvesting time two or three different samples of each variety were taken, and the results averaged. The sugar in the beets was determined in these samples by the alcohol method of Tollens-Rapp-Degener (Koenig, *Unters. landw. wicht. Stoffe*, 1891, p. 436). The results of the analyses are given in the following table:

Sugar beet season, 1891.

SAMPLES TAKEN SEPTEMBER 26.

Name of variety.	Average weight of beets.	Solids in juice.	Sugar in juice.	Purity coefficient.	Sugar in the beets.
	<i>Pounds.</i>	<i>Per cent.</i>	<i>Per cent.</i>		<i>Per cent.</i>
Le Maire's Richest	1.32	19.05	15.71	82.5	.....
Simon LeGrande .....	.88	19.64	16.45	83.8	.....
Vilmorin .....	.77	20.54	17.26	84.2	.....
Kleinwanzlebener .....	.62	21.82	18.75	85.0	.....
Bulteau Desprez .....	.82	22.62	19.47	86.1	.....
Desprez .....	.50	21.05	17.67	84.00	.....
La Plus Riche .....	.75	22.40	19.37	86.6	.....
E. Kroemer .....	.55	23.00	19.44	84.5	.....
O. B. S. & Co .....	.48	22.40	18.38	82.0	.....
French .....	.43	23.05	28.43	88.6	.....
German .....	.55	24.15	20.59	85.3	.....

SAMPLES TAKEN AT HARVESTING TIME, OCTOBER 26.

Le Maire's Richest	1.28	19.72	16.97	86.1	14.54
Simon LeGrande	1.08	18.52	14.99	81.0	13.27
Vilmorin .....	.71	21.07	17.95	85.2	15.63
Kleinwanzlebener .....	.69	21.77	18.78	86.3	15.70
Bulteau Desprez .....	.61	20.69	16.84	81.4	15.67
Desprez .....	.73	21.38	17.28	80.8	14.87
La Plus Riche .....	.57	22.23	18.24	82.0	15.50
F. Kroemer .....	.49	22.79	19.35	84.9	15.99
O. B. S. & Co .....	.53	22.25	17.81	80.0	15.61
French .....	.70	21.25	17.37	81.7	16.17
German .....	.37	23.86	20.53	86.1	17.56
Average of analyses, October 26 .....	.71	21.41	17.83	83.3	15.50

The analyses of the samples taken September 26 agree as well as could be expected with those of the samples taken at harvesting time. The latter samples were taken from the harvested beets when a good idea could be obtained of the average size of each variety. It may be said, in general, that the quality of the beets did not improve after September 26, and it is not likely that the yield was increased perceptibly during the month of October, owing to the extreme dryness of the soil. The beets were very small, averaging only about 11 ounces for all the varieties. The average per cent of sugar (sucrose) in the juice at harvesting time was 17.83 per cent, ranging from 14.99 to 20.53 per cent. The average sucrose in the beets was 15.50 per cent, with 13.27 per cent and 17.56 per cent as lowest and highest limit. By dividing 15.50 by 17.83 we find that the beets contained 86.9 per cent of juice on an average, showing that the dry season produced beets with unnaturally high sugar content and with a low percentage of juice.

It will be noticed that the percentages of sugar increase as we go down in the table—that is, with the beets growing farther east on the plot. We saw that the soil was drier and perhaps also poorer in the eastern part of the field than in the western, and the beets were smaller in size and richer in sugar the farther east we go in the field. As a rule, size and sugar content of the beets stand in inverse ratio to one another.

YIELD OF BEETS.

The following table will give the necessary data with reference to yield of beets and of tops from the plat and the estimated yield of beets and of sugar per acre:

Yield of beets and of tops.

No. of rows.	Name of variety.	Beets from plot.	Tops from plat.	Dirt on beets.	Washed beets per acre.	Sugar per acre.
		<i>Pounds.</i>	<i>Pounds.</i>	<i>Per cent.</i>	<i>Pounds.</i>	<i>Pounds.</i>
22	Le Maire's Richest	4,828	1,570	8.1	17,651	2,566
18	Simon LeGrande	4,204	1,334	4.4	10,473	1,390
16	Vilmorin	2,994	654	9.7	15,494	2,421
14	Kleinwanzlebener	2,804	1,003	13.1	15,960	2,506
14	Bulteau Desprez	2,624	772	14.7	14,662	2,298
20	Desprez	3,534	768	8.9	14,758	2,195
18	La Plus Riche	2,780	632	13.3	12,280	1,903
16	F. Kroemer	2,188	504	12.5	10,973	1,755
16	O. B. S. & Co.	2,355	568	12.4	11,745	1,833
14	French	1,945	466	12.4	12,284	1,986
15	German	1,701	460	14.8	8,860	1,555
	Total from plat. 1.945 acres	31,957	8,736			
	Average per acre				14,677	2,267

The beets yielded a little more than 7 tons to the acre and a little more than 1 ton of sugar to the acre. Last year under favorable conditions of weather the yield was 15 to 26 tons per acre, with an estimated yield of 2 to 3½ tons of sugar per acre. Owing to the extreme drought, the like of which according to the testimony of many old settlers has not been seen for a generation with us, the beets yielded less than a half crop. The yield of 7 tons to the acre may therefore be considered the very lowest returns which will be obtained where good cultivation and care are bestowed on the beets with us.

No comparison can be made between the different varieties as regards quality or yield, the difference between the different parts of the field being greater than that between the different varieties. The varieties being under the most favorable conditions (on the lowest ground, which contained most moisture) gave the largest yields per acre of both beets and sugar.

BEETS FROM FARMERS IN DIFFERENT PARTS OF THE STATE.

One thousand pounds of imported white imperial sugar-beet seed was bought by the station last spring from the Menomonee Falls Sugar Company, and distributed in pound packages to 851 farmers, requesting them to keep notes as to the growth and cultivation of the beets and to forward samples of the beets grown for analysis to this station in the fall. Owing to the drought, the beets did not do well with a large number of farmers, and many paid but little attention to them as a consequence; in all, 373 samples of beets were received and analyzed by the writer. Twenty samples were forwarded by mistake to the U. S. Department of Agriculture in Washington, D. C., and analyzed by their chemists. Of the farmers receiving sugar-beet seed from us, 33 reported failure of the crop, and four wrote they did not plant the seed. The samples analyzed were all from the White Imperial seed sent out, except where otherwise stated. The 373 samples came from fifty-nine counties in the State, making only nine counties that were not represented.

Most portions of the State suffered greatly from the drought, although not all as much as the central part. The following table will give an idea of the distribution of rain during the summer months at 17 weather-service stations in different parts of the State. The table is condensed from data furnished by Mr. W. L. Moore, forecast official, Milwaukee, Wis., to whom credit is due for the favor.

Rainfall May to October, inclusive, 1891, in inches.

Name of station.	County.	May.	June.	July.	Aug.	Sept.	Oct.	Total.	Normal precipitation.
Prairie du Chien.....	Crawford.....	1.65	2.95	1.76	2.32	1.73	1.82	12.23	.....
Madison.....	Dane.....	1.42	3.68	2.64	1.41	.38	1.49	11.02	21.7
Eau Claire.....	Eau Claire.....	2.00	5.40	2.20	1.70	1.70	3.10	15.47	.....
Fond du Lac.....	Fond du Lac.....	.44	2.73	2.94	2.17	.58	1.63	10.49	.....
Watertown.....	Jefferson.....	1.83	.....	2.25	1.47	.48	2.06	*8.09	.....
Kenosha.....	Kenosha.....	1.52	4.27	3.67	1.62	.72	.....	*11.80	.....
Lincoln.....	Kewaunee.....	.83	3.12	1.85	3.62	1.42	.....	*10.84	.....
La Crosse.....	La Crosse.....	.69	5.62	2.92	1.48	1.77	1.87	14.35	23.1
Manitowoc.....	Manitowoc.....	.29	3.73	2.16	2.42	.76	1.70	11.06	19.7
Milwaukee.....	Milwaukee.....	1.47	4.98	3.57	2.83	.18	1.66	14.69	19.8
Appleton.....	Outagamie.....	.01	5.20	5.20	1.45	.69	1.43	13.98	.....
Jamesville.....	Rock.....	.21	5.19	3.22	.....	.18	2.35	*11.15	.....
Hammond.....	St. Croix.....	1.19	7.61	2.73	2.20	1.48	1.98	17.19	.....
Shawano.....	Shawano.....	.11	2.95	1.70	2.79	1.13	1.23	9.91	.....
Medford.....	Taylor.....	.46	3.54	2.27	2.08	2.60	3.20	14.15	.....
Hillsboro.....	Vernon.....	.70	3.47	2.99	1.36	1.04	2.03	11.59	.....
Centralia.....	Wood.....	.37	3.46	2.85	3.48	2.28	1.52	13.96	.....

* Total for four months.

We give here the results of the analysis of sugar beets made by the U. S. Department in Washington. The beets were forwarded during the first days of October and must have been harvested between September 15 and 25.

Analyses of sugar beets grown in Wisconsin, 1891. Analyses made by U. S. Department of Agriculture, Washington, D. C.

Serial No.	Name.	Post-office.	County.	Average weight of beets.	Sugar in juice.	Sugar in beets.	Purity*	Variety.
				Ounces.	Pr. ct.	Pr. ct.	Coefficient.	
15258	Ang. Kreamer.....	Green Bay.....	Brown.....	33½	9.44	8.97	83.5	Imperial.
15207	E. T. Mixdorf.....	Dorchester.....	Clark.....	12½	12.88	12.22	74.9	Kleinwanzleben.
15208	do.....	do.....	do.....	12	15.42	14.65	83.1	Do.
15201	John Michler.....	Doylstown.....	Columbia.....	17½	8.15	7.65	61.7	Do.
15260	Wm. Kube.....	Richwood.....	Dodge.....	21½	8.78	8.27	69.6	Imperial.
15230	Jos. Zeller.....	Calumetville.....	Fond du Lac.....	30½	11.34	10.77	77.7	Do.
15269	A. Langmore.....	Montfort.....	Grant.....	15	12.61	11.98	80.0	Do.
15206	R. R. Roberts.....	Monroe.....	Green.....	14½	12.59	11.96	77.3	French.
15209	Henry Osborn.....	Brooklyn.....	do.....	16	11.61	11.02	76.0	Kleinwanzleben.
15202	J. C. Loomis.....	Alma Center.....	Jackson.....	32½	11.32	10.75	76.6	Do.
15271	Jacob Reth.....	Ahnapee.....	Kewaunee.....	6½	13.26	12.60	77.5	German.
15173	L. Vaughan.....	Unity.....	Marathon.....	10½	15.65	14.87	82.4	Kleinwanzleben.
15174	Z. G. Taylor.....	Packwaukee.....	Marquette.....	20	10.20	9.69	65.0	Do.
15225	W. E. Volk.....	Oconto Falls.....	Oconto.....	21½	13.37	12.76	78.6	Do.
15257	G. F. Wieseman.....	Olivet.....	Pierce.....	19	11.29	10.72	72.0	Imperial.
15169	A. Austin.....	Janesville.....	Rock.....	60½	9.17	8.71	70.1	Do.
15211	E. Hubbell.....	do.....	do.....	14½	12.89	12.29	72.9	Do.
15253	Thos. Matchie.....	Elk Creek.....	Trempealeau.....	34½	7.38	7.10	65.3	Do.
15226	M. J. Warner.....	do.....	do.....	16½	12.24	11.62	77.3	Do.
15213	Jno. E. Hughes.....	Wales.....	Waukesha.....	31½	10.58	10.05	71.1	Do.
				22½	11.51	10.93	.....

* i. e., the ratio of sugar to the other solids in the juice of the beet.

As will be noticed, nearly all the analyses come very low, only two samples analyzing above 15 per cent of sugar in the juice, and only nine out of twenty above 12 per cent. Doubtless the early date at which the beets were harvested will largely explain their inferior

quality. No further data are on hand as regards soil, period of growth, or yield of beets from an acre of land.

We shall now give the analyses of samples of sugar beets made at this station during the past fall, along with such additional information as to the culture of the beets as it has been possible to gather. The analyses are arranged alphabetically according to counties and according to post-offices within each county. The data for each county are averaged so as to give the average size of the samples received from each county, the yields of beets, solids and sugar in the juice, and the purity coefficients.

Sugar beets in Wisconsin, season of 1891, arranged alphabetically according to counties.

No.	Name of grower.	Post-office.	County.	Time of planting.	Time of harvest- ing.	Soil.	Average weight of beets.	Yield per acre.	Solids in juice.	Sugar in juice.	Purity coeffi- cient.	Remarks.
1	Ole Olson.....	Arkdale.....	Adams.....	May 20.....	Oct. 10.....	Sandy loam...	Pounds. 1.27.....	Pounds. 10,540.....	Per cent. 15.05.....	Per cent. 11.32.....	75.2.....	Umanured.
2	N. Barnes.....	Easton.....	do.....	May 8.....	Nov. 1.....	do.....	1.33.....	26,560.....	17.22.....	13.86.....	80.5.....	Barnyard manure.
3	C. R. Sickles.....	Plainville.....	do.....	May 14.....	Oct. 9.....	do.....	1.78.....		14.58.....	10.79.....	74.0.....	Horse manure.
	Average.....						1.46.....	18,550.....	15.62.....	11.99.....	76.1.....	
4	A. Grulickson.....	Cameron.....	Barron.....	Apr. 30.....	Oct. 16.....	Sandy loam...	.83.....		16.15.....	12.87.....	78.1.....	Barnyard manure,
5	G. O. Wall.....	Dallas.....	do.....	May 25.....	Oct. 24.....	Clayey soil...	1.25.....	57,610.....	18.32.....	14.17.....	77.3.....	Umanured.
6	M. A. Gates.....	Sprague.....	do.....	May 7.....	Oct. 15.....	Clay.....	1.63.....	13,130.....	15.15.....	11.18.....	73.7.....	Do.
	Average.....						1.24.....	35,370.....	16.54.....	12.74.....	77.....	
7	F. Zimmerman.....	Green Bay.....	Brown.....	May 15.....	Oct. 15.....	Sandy.....	3.68.....	21,780.....	13.55.....	9.74.....	71.9.....	Do.
8	W. Thelen.....	do.....	do.....	June 1.....	Oct. 10.....	Black sand...	.92.....	49,985.....	16.36.....	13.24.....	80.9.....	
9	Jacob Hein.....	Greenleaf.....	do.....	Apr. 20.....	Oct. 10.....	Clayey.....	2.45.....		15.53.....	12.01.....	77.1.....	
10	J. E. Duaine.....	West De Pere.....	do.....	May 19.....	Oct. 8.....	Sandy loam...	2.15.....		11.88.....	7.99.....	67.2.....	
	Average.....						2.30.....	35,883.....	14.34.....	10.75.....	74.9.....	
11	P. F. Mueller.....	Fountain City.....	Buffalo.....	Apr. —.....	Oct. 12.....	Sandy loam...	*1.30.....		22.42.....	16.68.....	74.4.....	
12	J. B. Meyer.....	Modena.....	do.....	Apr. —.....	Oct. 12.....	do.....	1.07.....	40,000.....	16.50.....	13.30.....	80.7.....	Do.
13	do.....	do.....	do.....	Apr. —.....	Oct. 12.....	do.....	1.82.....		16.95.....	14.54.....	85.8.....	Do.
14	Alfred Day.....	Mondovi.....	do.....	May 27.....	Oct. 29.....	Sandy.....	.57.....		19.18.....	16.40.....	85.5.....	Do.
15	Geo. Hess.....	Montana.....	do.....	May 27.....	Oct. 10-20.....	Black mold...	1.95.....	32,000.....	16.78.....	11.42.....	68.0.....	Horse manure.
16	Jacob Angst.....	Waumandee.....	do.....	May 5.....	Oct. 12.....	Sandy.....	1.15.....	23,410.....	14.53.....	9.60.....	65.9.....	Stable manure.
	Average.....						1.14.....	31,803.....	17.74.....	13.66.....	77.0.....	
17	G. Abitz.....	Brillion.....	Cahmet.....	May 25.....	Oct. 15.....	Red clay.....	.88.....		14.38.....	10.09.....	70.2.....	Horse manure.
18	Aug. A. Paulsen.....	New Holstein.....	do.....	May 15.....	Nov. 1.....	Heavy clay...	.65.....	20,040.....	19.22.....	15.92.....	82.8.....	Umanured.
	Average.....						.77.....	20,040.....	16.80.....	13.00.....	77.7.....	
19	Joseph Ruff.....	Blomer.....	Chippewa.....	May 20.....	Oct. 17.....	Sandy.....	2.18.....	24,390.....	13.69.....	10.29.....	75.7.....	Horse manure.
20	A. B. Peterson.....	do.....	do.....	May 26.....	Oct. 20.....	Sandy loam...	2.73.....	10,840.....	16.34.....	11.73.....	71.8.....	Umanured.
21	A. Bischof.....	do.....	do.....	May 15.....	Oct. 9.....	do.....	3.52.....	10,800.....	14.88.....	10.62.....	71.4.....	Stable manure.
22	P. Boden.....	Boyd.....	do.....	May 30.....	Oct. 25.....	Black soil...	3.45.....		16.05.....	11.91.....	74.2.....	Do.
23	J. W. Thomas.....	Chippewa Falls.....	do.....	May 2.....	Oct. 12.....	Sandy loam...	2.23.....	96,270.....	14.58.....	11.23.....	77.0.....	5 bushels ashes per acre.
24	do.....	do.....	do.....	May 2.....	Oct. 12.....	do.....	2.60.....	117,610.....	14.82.....	10.97.....	74.0.....	10 tons cow manure per acre.

† Beets considerably wilted.

* Kleinwanzlebener. Seed from U. S. Department of Agriculture.

Sugar beets in Wisconsin, season of 1891, arranged alphabetically according to counties—Continued.

No.	Name of grower.	Post-office.	County.	Time of planting.	Time of harvest- ing.	Soil.	Average weight of beets.	Yield per acre.	Solids in juice.	Sugar in juice.	Purity coeffi- cient.	Remarks.
25	M. Sarrafin.....	Chippewa Falls.....	Chippewa.....	May 13.....	Oct. 8.....	Sandy.....	<i>Pounds.</i> 3.10.....	<i>Pounds.</i>	<i>Per cent.</i> 13.82.....	<i>Per cent.</i> 9.93.....	71.8.....	Unmanured.
26	Ph. Rheingaus.....	do.....	do.....	May 6.....	Oct. 17.....	Sandy loam.....	4.08.....	.....	15.68.....	11.77.....	75.0.....	Hog manure.
	Average.....						2.99.....	15,330.....	14.97.....	11.06.....	73.2.....	
27	F. Mueller.....	Curtiss.....	Clark.....	May 10.....	Oct. 10.....	Sandy clay.....	1.07.....	6,000.....	16.82.....	14.02.....	83.3.....	Stock manure.
28	F. W. Kalepp.....	Dorchester.....	do.....	May 13.....	Oct. 15.....	Black humus.....	1.20.....	.....	17.45.....	13.20.....	75.7.....	Do.
29	Matt Wells.....	Neillsville.....	do.....	May 23.....	Oct. 10.....	Sandy loam.....	1.93.....	32,670.....	15.05.....	12.34.....	82.0.....	Unmanured.
30	L. Randall.....	do.....	do.....	May 21.....	Oct. 12.....	Loam.....	1.45.....	31,120.....	17.35.....	14.31.....	82.5.....	Do.
31	C. G. Gotsinger.....	Sterling.....	do.....	May 7.....	Sept. 23.....	Sandy clay.....	1.78.....	.....	14.58.....	10.79.....	74.0.....	Do.
	Average.....						1.49.....	41,263.....	16.25.....	12.95.....	79.5.....	
32	R. J. Karow.....	Columbus.....	Columbia.....	May 20.....	Nov. 5.....	Clay.....	4.20.....	.....	*17.40.....	11.89.....	68.3.....	Barnyard manure.
33	Th. Anderson.....	Doytstown.....	do.....	May 10.....	Oct. 20.....	Black soil.....	.70.....	1,920.....	*17.22.....	11.27.....	65.4.....	Unmanured.
34	H. Randall.....	Fall River.....	do.....	May 11.....	Oct. 16.....	Sandy.....	2.78.....	12,000.....	15.90.....	10.97.....	69.0.....	Do.
35	R. Hopkins.....	Leeds.....	do.....	May 11.....	Oct. 11.....	Prarie.....	2.17.....	.....	15.85.....	12.27.....	77.4.....	Barnyard manure.
36	Ch. Schlee.....	Portage.....	do.....	May 14.....	Oct. 16.....	Sandy.....	.83.....	10,800.....	†29.14.....	15.70.....	78.0.....	
37	J. L. Curtis.....	Poynette.....	do.....	June 5.....	Oct. 9.....	Clay.....	2.17.....	.....	14.70.....	11.70.....	79.3.....	
	Average.....						2.14.....	8,240.....	16.89.....	12.30.....	72.8.....	
38	A. Spatek.....	Eastman.....	Crawford.....	May 21.....	Oct. 13.....	Red clay.....	8.02.....	44,800.....	11.75.....	7.61.....	64.7.....	Hog manure.
39	C. C. Pickett.....	Harbort.....	do.....	June 1.....	Oct. 12.....	Black loam.....	2.92.....	.....	13.18.....	8.81.....	66.9.....	
40	H. Wadler.....	Prarie du Chien.....	do.....	May 20.....	Oct. 15.....	Sandy loam.....	4.33.....	28,800.....	12.95.....	9.88.....	76.3.....	Unmanured.
41	G. J. Schoeller.....	do.....	do.....	May 9.....	Sept. 20.....	Clay.....	1.78.....	18,000.....	18.14.....	14.07.....	77.6.....	Do.
	Average.....						4.26.....	30,533.....	14.01.....	10.09.....	72.0.....	
42	L. A. Halvorson.....	Adsit.....	Dane.....	May 17.....	Oct. 12.....	Light clay.....	1.65.....	21,340.....	18.12.....	12.90.....	71.2.....	Do.
43	C. G. Johnson.....	Brooklyn.....	do.....	May 15.....	Oct. 20.....	Black soil.....	1.83.....	10,000.....	†23.26.....	19.83.....	85.2.....	Barnyard manure.
44	J. C. Cannon.....	Hanerville.....	do.....	May 15.....	Oct. 12.....	Sandy.....	2.11.....	43,630.....	15.40.....	11.98.....	77.7.....	Stock manure.
45	E. Evans.....	McFarland.....	do.....	May 23.....	Oct. 1.....	Black loam.....	.57.....	.....	17.45.....	14.56.....	83.3.....	Unmanured.
46	R. Williamson.....	Madison.....	do.....	May 10.....	Oct. 7.....	Clay.....	2.02.....	28,000.....	15.18.....	11.26.....	74.2.....	Do.
47	W. H. Pauli.....	do.....	do.....	May 12.....	Oct. 15.....	Black loam.....	.93.....	26,400.....	29.84.....	15.95.....	76.5.....	Do.
48	J. Saehjen.....	do.....	do.....	May 30.....	Oct. 23.....	Clay.....	1.90.....	19,200.....	18.28.....	14.52.....	79.4.....	Horse manure.
49	H. Stopplewerth.....	do.....	do.....	May 16.....	Nov. 5.....	Heavy clay.....	4.30.....	30,000.....	16.78.....	13.48.....	80.3.....	
50	W. J. Radke.....	Marshall.....	do.....	May 3.....	Nov. 3.....	Black soil.....	1.30.....	.....	17.18.....	12.45.....	72.4.....	
51	L. Lawrence.....	Middleton.....	do.....	June 3.....	Oct. 20.....	Sandy loam.....	1.27.....	63,400.....	16.16.....	10.99.....	69.6.....	Unmanured.
52	J. R. Hintonson.....	Riley.....	do.....	May 24.....	Oct. 10.....	Clay.....	1.18.....	.....	17.01.....	13.64.....	80.2.....	

53	E. A. Wright	Stoughton	Chippewa	May 19	Oct. 5	Clay loam	1.93	17,280	17.45	13.71	78.6	Do.
	Average						1.75	28,805	17.76	13.77	77.5	
54	J. C. Lieske	Clyman	Dodge	May 26	Oct. 13	Black soil	.63	9,800	17.0	14.64	86.2	Do.
55	J. Woodbran	Fox Lake	do	May 25	Oct. 13	Clay	5.13		14.0	10.11	72.2	Do.
56	Ch. Discher	Horicon	do	May 25	Oct. 16	do	4.43	49,600	13.78	9.50	68.9	Do.
57	A. C. Becker	Jineau	do	May 22	Oct. 12	do	2.00		16.90	12.99	76.9	Cow manure.
58	F. Holz	Kenosha	do	May 12	Oct. 23	Sandy loam	4.05	71,438	16.52	11.93	72.3	Horse manure.
59	E. G. Breslow	Knolls	do	Apr. 20	Oct. 17	Black loam	3.27	58,806	14.48	10.82	74.7	Do.
60	A. O. Cuts	Mayville	do	May 15	Oct. 19	do	2.10		16.60	12.93	77.9	Unmanured.
61	L. Superfeld	Oak Grove	do	May 15	Oct. 14	Black	1.62	35,000	14.25	9.94	69.8	Barneyard manure.
62	T. Wetemeyer	Richwood	do	May 17	Oct. 22	Clay loam	1.13	24,000	19.30	16.23	84.1	Unmanured.
63	Geo. Reklund	Theresa	do	May 13	Oct. 9	Yellow clay	2.22		16.16	11.88	73.5	Stock manure.
	Average						2.66	41,441	15.90	12.10	76.2	
64	A. J. Eiedinger	Stevensons Pier	Door	May 4	Oct. 15	Sandy loam	.75	29,620	17.17	14.14	76.9	Barneyard manure.
65	E. Birmingham	Sturgeon Bay	do	June 13	Oct. 14	Black sand	1.78	26,140	19.05	15.14	79.5	Horse manure.
66	L. R. Stopleinson	do	do	May 20	Oct. 24	Sandy	2.52	75,359	17.70	14.56	81.9	Barneyard manure.
	Average						1.67	42,780	18.24	14.59	80.0	
67	S. Rudesill	Downing	Dunn	May 30	Oct. 8	Clay loam	2.17	16,730	14.70	11.68	79.5	Unmanured.
68	W. Suser	do	do	May 15	Nov. 1-3	Black bottom	2.28	8,400	15.40	11.53	74.9	Do.
69	J. W. Atkinson	Downsville	do	May 25	Oct. 14	Heavy timber	1.77		15.25	11.92	78.2	Do.
70	R. Cunningham	do	do	May 23	Nov. 2	Black soil	1.38		16.72	12.71	76.0	Do.
71	M. McDonald	Elk Mound	do	May 15	Oct. 25	Loam	2.82	120,640	17.46	13.55	77.6	Horse manure.
72	Thos. Darling	Knapp	do	May 20	Oct. 8	Clay loam	2.97	57,100	12.95	9.77	75.5	Unmanured.
73	John Reinecke	Memonie	do	May 16	Oct. 9	Sandy loam	3.58	27,920	17.60	14.57	82.8	Do.
74	Wm. Moody	do	do	May 21	Oct. 19	Clay loam	1.88		16.36	12.35	75.5	
75	Wm. Miller	Rusk	do	May 20	Oct. 19	Clay loam	2.87	15,680	15.85	11.65	73.5	
	Average						2.41	25,766	15.81	12.19	77.1	
76	C. Bernicke	Altoona	Eau Claire	Apr. 20	Oct. 1	Sandy	2.15	3,200	14.90	11.91	79.9	Hog manure.
77	R. Schilling	do	do	May 21	Oct. 13	Sandy loam	1.97		14.20	11.60	81.5	Unmanured.
78	D. M. Sherman	Eau Claire	do	May 20	Oct. 6	do	2.85	38,400	15.85	12.41	78.3	Do.
79	R. J. Kepler	do	do	May 28	Oct. 10	do	2.02	31,100	15.68	11.66	74.4	Do.
80	A. J. Chesbro	do	do	May 20	Oct. 19	do	1.48		15.43	12.34	79.9	Do.
81	G. W. Huclkin	do	do	May 20	Oct. 1	do	1.70		15.75	11.52	73.1	Do.
82	F. Mueller	Fall Creek	do	May 10	Oct. 1	Sandy	1.33	48,000	15.40	12.51	81.2	Horse manure.
83	John Nix	Nixcorner	do	May 11	Oct. 8	Sandy loam	.43	19,200	16.15	12.12	73.1	Stable manure.
84	S. E. Coon	Otter Creek	do	June 2	Nov. 1	Sandy clay	1.05		17.58	12.98	73.8	Barneyard manure.
	Average						1.66	27,980	15.66	12.12	77.4	
85	G. Stelter	Fair Water	Fond du Lac	May 23	Oct. 15	Burr oak soil	2.48	19,520	13.08	8.87	67.8	Unmanured.
86	P. C. Jacobs	Kirkwood	do	May 10	Oct. 21	Black soil	2.75	18,000	17.90	14.71	82.2	
87	Peter Korb	Marytown	do	June 5	Oct. 17	do	3.12		13.50	9.61	71.2	

* Beets somewhat wilted.

† Beets considerably wilted.

No.	Name of grower.	Post-office.	County.	Time of planting.	Time of harvesting.	Soil.	Average weight of beets.	Yield per acre.	Solids in juice.	Sugar in juice.	Purity coefficient.	Remarks.
88	H. L. Clapp.	Ripon.	Font du Lac.	May 20	Oct. 20	Black prairie.	Pounds. 1.08	Pounds. 21,440	Per cent. 18.42	Per cent. 13.82	75.0	Slack manure.
89	J. Cronk.	Waupun.	do.	May 7	Nov. 1	do.	2.68	12,000	15.02	10.45	66.9	Barnyard manure.
	Average.						2.42	17,740	15.70	11.40	73.2	
90	John Maslaun.	Crandon.	Forrest.	May 15	Oct. 10	Sandy loam.	1.85	12,000	13.30	9.64	72.5	Do.
91	John Harris.	Bagley.	Grant.	May 24	Oct. 15	do.	3.42	26,400	15.80	10.90	68.7	Unmanured.
92	J. Baumgartner.	Fennimore.	do.	May 23	Oct. 10	Clay	2.72	26,400	15.0	11.28	75.2	Barnyard manure.
93	R. H. Davidson.	Mount Hope.	do.	May 10	Oct. 14	Bottom & clay.	3.07	10,135	14.35	10.13	70.6	Unmanured.
94	J. H. Wise.	Platteville.	do.	June 9	Oct. 16	Prairie loam.	1.62	17,925	17.92	12.35	68.8	Unmanured.
95	do.	do.	do.	June 1	Oct. 17	Timber soil.	1.48	18,145	18.14	13.46	74.2	Barnyard manure.
	Average.						2.46	26,400	16.25	11.62	71.5	
96	John Elmer.	Browtown.	Green.	May 12	Oct. 17	Rich soil.	1.28	37,670	17.70	13.91	78.6	Unmanured.
97	Thos. Sears.	Monticello.	do.	May 10	Oct. 30	Loam.	1.35	37,670	17.92	14.58	81.9	Do.
98	H. G. Bahr.	Berlin.	Green Lake.	May 25	Oct. 18	Sandy	1.43	37,670	17.81	14.30	80.3	Do.
	Average.						2.55	37,670	17.48	11.31	78.1	
99	M. Treseder.	Ridgeway.	Iowa.	May 10	Oct. 7	Clay	3.63	41,380	14.88	10.83	72.8	Do.
100	Thos. Conway.	do.	do.	May 30	Oct. 20	Prairie loam.	2.83	69,696	14.20	9.80	68.6	Do.
101	D. L. Rogers.	Wyoming.	do.	June 6	Oct. 10	Sandy loam.	2.75	69,696	13.30	9.60	72.1	Barnyard manure.
	Average.						3.07	55,538	14.16	10.08	71.2	
102	H. Overby.	Sochleville.	Jackson.	May 26	Oct. 15	Bottom land.	4.12	69,696	11.88	7.79	65.6	Unmanured.
103	Chas. Japuth.	Oak Hill.	Jefferson.	May 21	Oct. 26	Clay.	1.88	69,696	18.75	15.95	85.1	Do.
104	L. M. Krippner.	Oakland.	do.	May 30	Oct. 15	Heavy clay.	1.42	10,560	18.10	14.13	78.0	Hog manure.
105	Ph. Japuth.	Palmyra.	do.	May 12	Oct. 13	Black sand.	1.82	40,000	23.08	8.33	68.9	Barnyard manure.
106	J. Selchochert.	Watertown.	do.	May 15	Sept. 21	Sandy clay.	1.65	40,000	26.10	23.52	90.1	Unmanured.
107	F. Hartwig.	do.	do.	May 25	Sept. 22	Clay.	1.10	35,840	21.45	16.88	79.8	
108	J. Brockmann.	do.	do.	May 5	Oct. 9	Black soil.	1.85	18,385	14.38	14.24	77.5	
109	J. Rafferty.	do.	do.	May 4	Oct. 16	Red clay.	1.97	22,400	17.45	14.43	82.7	Stock manure.
110	A. Krueger.	do.	do.	May 15	Oct. 15	Clay.	1.58	17,500	17.50	14.02	80.1	Unmanured.
111	B. Boelle.	do.	do.	May 1	Oct. 15	Black soil.	1.40	17,300	18.10	14.12	81.6	Cow manure.
112	C. Dippel.	do.	do.	May 15	Oct. 15	Clay.	1.80	12,950	18.10	12.95	71.6	
113	T. Loebler.	do.	do.	June 5	Oct. 19	do.	1.75	19,025	19.02	14.97	78.7	Horse manure.
114	D. Hildemann.	do.	do.	May 10	Oct. 14	do.	1.23	12,000	17.96	14.68	81.7	
	Average.						1.29	27,137	18.49	14.85	78.2	

115	Jas. Mutch.	Elroy	Juncat	May 24	Oct. 23	Prairie soil	2.25	24,000	16.0	12.07	75.4	Unmanured.
116	F. Prevez	do	do	May 12	Oct. 24	Clay	2.02	15,800	17.70	12.78	72.2	Vilmorin seed from U. S. Department of Agriculture.
117	A. Pazik	Lyndon	do	May 16	Oct. 16	Sandy	1.33		19.16	14.94	78.0	Cow manure.
118	N. M. Fess	New Lisbon	do	May 18	Oct. 15	do	3.08	86,420	16.90	12.54	74.2	Barnyard manure.
119	A. M. Smith	do	do	May 20	Oct. 17	do	2.65		16.90	13.02	77.0	
120	E. Cook	do	do	June 10	Oct. 20	do	2.53	53,330	16.36	12.89	78.8	
	Average						2.31	50,638	17.17	13.04	76.0	
121	G. H. Kroenke	Wilmot	Kenosha	May 11	Oct. 12	Black loam	2.68	43,500	16.28	12.71	78.1	Cow manure.
122	W. B. Ray	Alaska	Kewaunee	May 8	Oct. 19	Loam	1.37	26,240	17.92	13.67	76.3	Barnyard manure.
123	F. Werth	Carlton	do	May 23	Oct. 20	Clay	3.30		18.14	13.24	73.2	Unmanured.
124	K. Galenburger	Kewaunee	do	May 25	Oct. 22	Clay loam	2.40		16.28	11.91	73.1	Seed from Nebraska.
125	J. Moratek	do	do	May 31	Oct. 16	Clay	3.63		12.10	7.27	60.5	French seed from Washington, D. C.
126	John Jellneck	do	do	May 12	Oct. 20	do	1.88		19.00	15.88	83.6	Seed from Washington, D. C.
127	Chr. Trakel	do	do	June 20	Oct. 16	do	2.63		16.42	12.72	77.5	Seed from Nebraska.
128	F. Bassardick	do	do	May 5	Oct. 22	Rich clay	1.65		16.32	12.22	74.9	Seed from Washington, D. C.
129	Chr. Boettcher	do	do	May 14	Oct. 20	Clay	1.88		14.45	9.59	65.0	Manured in fall.
130	H. Reirdance	do	do	May 20	Oct. 3	Clay loam	3.00		17.32	13.43	74.0	Seed from Washington, D. C.
131	Ant. Galenberger	do	do	May 28	Oct. 29	Sandy	2.28		16.10	12.01	74.6	Seed from Washington, D. C.
132	Aug. Rogenbaur	Krok	do	May 22	Oct. 20	Loam	1.42		17.70	13.24	74.8	Manured.
133	H. Strahls	Norman	do	June 3	Oct. 15	Sandy	1.27		16.87	12.49	74.0	
	Average						2.25	26,240	14.88	12.13	81.5	Horse manure.
134	W. F. Moesser	Lacrosse	Lacrosse	May 10	Oct. 9	Black loam	1.65	14,080	13.62	9.62	71.7	Unmanured.
135	H. Boissack	do	do	May 16	Oct. 12	Sandy loam	1.35	15,956	13.42	13.74	76.7	
136	Louis Wolf	do	do	May 3	Oct. 15	Black loam	3.35	30,090	17.92	13.20	77.9	
137	J. E. Lepke	do	do	June 3	Oct. 20	Clay	2.00		16.92	13.25	83.5	
138	John Dawson	do	do	May 1	Oct. 22	Sandy loam	2.27		15.40	10.14	65.8	
139	F. Wriensel	do	do	June 11	Oct. 26	Sandy loam	1.71		13.78	9.20	66.7	Barnyard manure.
140	Frank Wolf	do	do	May 10	Oct. 14	do	2.70		16.15	12.28	76.1	Horse manure.
141	Aug. Schläver, Jr.	Rockland	do	May 20	Oct. 18	Sandy loam	3.55	48,787	16.88	12.88	76.3	
142	O. F. Elwell	West Salem	do	May 12	Oct. 15	do	1.75	43,200	15.35	11.81	76.9	Unmanured.
	Average						2.17	30,401	15.62	11.18	71.6	Farmyard manure.
143	R. T. Lillie	Darlington	Lafayette	May 22	Oct. 23	Prairie	1.77	52,708	16.60	13.32	80.3	Unmanured.
144	R. D. Seely	do	do	May 3	Oct. 17	Black loam	2.30		16.18	12.78	79.1	
145	E. M. Curbett	Elk Grove	do	May 15	Oct. 20	do	1.98		14.94	12.27	77.0	
146	T. H. Buxton	do	do	June 18	Oct. 9	Clay	1.37					
	Average						1.86	52,708	14.94	12.27	77.0	

‡ Beets considerably wilted.

† Last year 33 tons of beets were obtained on same land.

* Beets much wilted.

Sugar beets in Wisconsin, season of 1891, arranged alphabetically according to counties—Continued.

No.	Name of grower.	Post-office.	County.	Time of planting.	Time of harvest- ing.	Soil.	Average weight of beets.	Yield per acre.	Solids in juice.	Sugar in juice.	Purity coeff- icient.	Remarks.
							Pounds.	Pounds.	Per cent.	Per cent.		
147	H. Brennecke.....	Antigo.....	Langlade.....	May 20	Oct. 10	Sandy loam....	1.60	48,120	15.85	12.91	81.4	Unmanured.
148	Thos. Martin.....	Merrill.....	Lincoln.....	May 30	Oct. 12	Clay loam.....	.68	16,355	17.40	14.90	83.5	Horse manure.
149	F. W. Rades.....	Kiel.....	Manitowoc.....	May 10	Oct. 23	Sandy.....	.63	9,600	18.10	14.47	80.0	Do.
150	A. Bieser.....	Manitowoc.....	do.....	May 15	Oct. 4	Sandy loam....	1.48	11,99	15.40	11.99	77.9	Unmanured.
151	H. C. Koch.....	do.....	do.....	May 8	Sept. 15	Sandy loam....	.98	18,30	15.40	14.79	79.9	Barnyard manure.
152	W. Wedekamp.....	do.....	do.....	May 26	Oct. 5	Loam.....	5.70	27,000	17.22	13.74	79.9	Do.
153	B. Dodan.....	Maple Grove.....	do.....	May 15	Oct. 3	Sandy loam....	2.63	27,000	15.22	11.70	76.9	Do.
154	J. Cochran.....	Mishicot.....	do.....	May 20	Oct. 16	Loam.....	1.50	16,000	15.05	10.82	71.9	Stable manure.
155	J. Thielke.....	School Hill.....	do.....	May 9	Oct. 7	Light soil.....	4.40	40,511	14.65	10.43	71.2	Do.
156	Max Boehm.....	Taus.....	do.....	May 15	Oct. 5	Black loam....	3.85	40,511	13.70	9.80	71.5	Do.
157	J. Reznicek.....	do.....	do.....	May 30	Oct. 12	Gravel.....	1.29	23,278	16.15	12.52	77.6	Unmanured.
	Average.....						2.49	23,278	15.44	12.25	79.3	
158	James Graham.....	Cody.....	Marathon.....	May 23	Oct. 7	Clay loam....	.71	31,362	15.11	11.54	76.4	Ashes.
159	Th. Wehrman.....	Denny.....	do.....	May 15	Oct. 15	Black soil.....	1.82	10,43	14.75	10.43	70.7	Manured.
160	Thomas O'Connor.....	Haldar.....	do.....	May 28	Oct. 20	Loam.....	2.08	16,72	16.72	12.47	74.5	Barnyard manure.
161	C. Weizenicker.....	Knowlton.....	do.....	May 15	Oct. 15	Sandy.....	1.13	8,000	15.60	11.93	76.5	Do.
162	A. Priest.....	Mosinee.....	do.....	May 25	Oct. 16	Loam.....	1.40	73,130	16.34	12.52	76.7	Unmanured.
163	I. Spindler.....	St. Francisville.....	do.....	May 4	Oct. 8	Sandy clay....	1.70	13,990	14.70	11.73	79.8	Stable manure.
164	F. Reckner.....	Wausau.....	do.....	May 12	Oct. 6	Black soil.....	1.05	19,10	13.95	13.21	83.5	Horse manure.
165	A. Baesman.....	Wein.....	do.....	May 11	Oct. 26	Clay.....	1.63	17,88	17.88	13.21	73.9	Unmanured.
166	F. Bauman.....	do.....	do.....	May 10	Oct. 30	do.....	.73	18,78	18.78	14.24	75.9	
	Average.....						1.25	32,105	16.55	12.67	76.5	
167	J. J. O'Leary.....	Peshigo.....	Marquette.....	May 10	Oct. 14	Sandy loam....	3.32	57,064	13.45	8.59	63.8	Stable manure.
168	H. Treffler.....	do.....	do.....	May 8	Oct. 29	Heavy soil....	3.20	57,064	13.72	8.95	65.3	
	Average.....						3.26	57,064	13.59	8.77	64.5	
169	H. L. Moore.....	Wauwatosa.....	Milwaukee.....	May 7	Oct. 6	Sandy loam....	1.29	39,640	18.02	12.15	67.5	Barnyard manure.
170	F. A. Meissner.....	Cashton.....	Monroe.....	May 16	Oct. 12	Clay.....	.82	61,444	18.82	16.15	85.8	Stable manure.
171	A. Boettcher.....	Kirby.....	do.....	June 20	Oct. 10	Sandy loam....	1.68	3,150	14.0	10.00	71.3	Horse manure.
172	A. G. Ayresworth.....	Leont.....	do.....	May 20	Oct. 23	Loam.....	1.85	23,210	14.70	11.30	76.9	Unmanured.
173	C. A. Voeiz.....	Portland.....	do.....	May 19	Oct. 13	Clay.....	1.85	26,448	15.90	12.91	81.2	
174	William Schmitz.....	St. Marys.....	do.....	June 1	Oct. 14	Loam.....	3.13	26,448	15.90	16.94	71.6	
175	A. Schläver, sr.....	Sparta.....	do.....	June 4	Oct. 19	do.....	2.58	16,988	13.86	9.63	65.2	Do.
176	Roswell Smith.....	do.....	do.....	May 24	Oct. 19	do.....	3.75	16,988	16.72	12.41	74.2	Do.
177	J. K. Davis.....	do.....	do.....	May 20	Oct. 24	Sandy.....	1.45	24,000	19.05	13.32	70.0	Barnyard manure.
178	F. Kemnow.....	Tonah.....	do.....	May 8	Oct. 1	Loam.....	1.90	16,80	16.80	14.21	84.6	Do.
179	E. G. Klune.....	do.....	do.....	May 29	Oct. 9	Sandy loam....	1.48	15,52	15.52	11.69	75.3	Unmanured.

180	B. Drowatzky	do	do	May 21	Oct. 15	Heavy clay	2.17	.....	15.84	11.65	73.6	Barnyard manure.
181	L. D. Wyatt	do	do	May 28	Oct. 19	Sandy	*1.35	.....	19.28	14.96	77.6	Do.
182	A. Scott	Warrens Mills	do	May 12	Oct. 15	Sandy loam	2.43	4, 634 48, 352	16.02	12.64	78.9	Do.
	Average						2.05	26, 281	16.28	12.40	76.2	
183	J. S. Harvey	Chase	Oconto	May 15	Oct. 10	Sandy	2.12	.....	15.55	12.17	78.3	Manured.
184	A. W. Boettcher	do	do	May 12	Oct. 16	Sandy loam	2.05	11, 520	15.12	11.26	74.4	Unmanured.
185	Jos. W. Wontler	Leau	do	May 13	Oct. 23	do	3.00	26, 890	16.27	10.97	79.7	Sheep manure.
186	James Bedore, Jr.	Little Suamico	do	May 25	Oct. 12	do	2.05	.....	16.08	13.01	80.9	Barnyard manure.
187	James Bedore, sr.	do	do	May 25	Oct. 12	do	2.20	.....	15.90	13.20	83.1	Do.
188	A. Kirchner	do	do	May 20	Oct. 15	Sandy	5.68	.....	14.65	10.81	73.8	Do.
189	Carl Irr	Morgan	do	May 21	Oct. 12	Loam	2.80	13, 500	16.78	13.64	81.3	Unmanured.
190	E. J. Martindale	do	do	May 12	Oct. 10	Clay loam	2.18	72, 000	16.10	13.06	81.2	Do.
191	A. Dudden	Oconto	do	May 11	Oct. 10	do	1.07	30, 040	16.42	13.63	83.0	Barnyard manure.
192	J. V. Herriman	do	do	May 20	Oct. 4	Loam	.95	.....	18.82	15.10	80.2	
193	J. A. Schweiberg	Spruce	do	May 15	Oct. 19	Clay loam	1.02	.....	19.45	15.77	81.1	
	Average						2.28	30, 790	16.81	13.45	80.1	
194	E. Gardner	Appleton	Outagamie	May 20	Oct. 10	Clay	3.17	.....	14.24	9.99	70.2	Unmanured.
195	A. Becker	do	do	May 20	Oct. 15	Black loam	4.05	17, 976	13.78	10.50	76.2	Stock manure.
196	C. Boettler	do	do	May 25	Nov. 5	Clay	1.32	.....	18.62	14.33	77.0	
197	J. P. Hinz	Binghamton	do	May 20	Oct. 15	Sandy	.88	.....	12.82	10.54	82.2	
198	C. Kreutzberg	Burgert	do	May 20	Oct. 17	Black sand	3.98	.....	13.30	9.27	69.7	
199	H. Wickert	Mackville	do	May 25	Oct. 15	Sandy	1.92	.....	18.14	14.02	77.2	
200	G. Breyer	Medina	do	May 16	Oct. 21	do	1.30	25, 408	16.00	11.29	70.6	Barnyard manure.
201	H. W. Kickholder	New London	do	May 20	Oct. 10	Loam	1.35	10, 890	15.22	12.60	82.8	Do.
202	Joshua Bull	Seymour	do	May 11	Oct. 20	Clay loam	3.35	67, 200	15.90	11.29	71.0	Hog manure.
203	E. Nickel	do	do	May 4	Nov. 4	Sandy loam	3.55	38, 400	15.62	11.98	76.7	Unmanured.
204	D. M. Torrey	Shiocton	do	May 10	Oct. 9	do	1.78	83, 160	13.10	9.55	72.9	Barnyard manure.
205	M. H. True	do	do	May 14	Oct. 9	do	2.08	72, 072	14.00	10.11	72.3	Unmanured.
206	W. D. Barnes	do	do	May 15	Oct. 6	Clay loam	1.17	67, 840	15.63	12.40	79.3	Barnyard manure.
	Average						2.30	47, 481	15.11	11.37	75.2	
207	Chas. Mueller	Cedarburg	Ozaukee	May 18	Oct. 22	Loam	1.42	43, 560	17.00	14.01	82.4	Stable manure.
208	F. Musbach	Grafton	do	May 16	Oct. 12	Red clay	3.32	32, 000	15.82	12.06	76.2	Unmanured.
209	Jos. Fletsner	Saukville	do	May 29	Oct. 3	do	1.78	48, 410	18.50	13.84	74.8	
	Average						2.14	41, 327	17.11	13.30	77.7	
210	F. Pittman	Arkansas	Pepin	May 11	Oct. 5	Loam	1.47	28, 832	16.90	13.77	81.5	Unmanured.
211	A. Faust	Durand	do	June 7	Oct. 13	Sandy clay	1.50	14, 400	15.05	12.36	82.0	Do.
212	A. J. Yatzek	do	do	.....	.....	.....	3.40	.....	17.68	13.16	74.5	
213	J. Wisinger	do	do	May 15	Oct. 20	Loam	1.37	.....	23.04	17.08	74.1	
	Average						1.94	21, 616	18.17	14.06	77.4	
214	J. O. Marber	Osceola Mills	Polk	June 3	Oct. 5	Sandy loam	.93	.....	14.70	11.09	75.4	Barnyard manure.

* Beets somewhat wilted.

Sugar beets in Wisconsin, season of 1891, arranged alphabetically according to counties—Continued.

No.	Name of grower.	Post-office.	County.	Time of planting.	Time of harvesting.	Soil.	Average weight of beets.	Yield per acre.	Solids in juice.	Sugar in juice.	Purity coefficient.	Remarks.
							<i>Pounds.</i>	<i>Pounds.</i>	<i>Per cent.</i>	<i>Per cent.</i>		
215	Edw. Young.....	Almond.....	Portage.....	May 20	Oct. 22	Loam.....	.83	9,681	18.30	14.32	78.3	Cow manure.
216	A. P. Andrews.....	Amherst.....	do.....	May 23	Oct. 13	Sandy loam.....	1.17	14,810	13.52	9.64	71.3	Unmanured.
217	G. Hoffman.....	do.....	do.....	May 25	Oct. 26	do.....	3.33	58,490	14.98	10.35	69.0	Do.
218	George Russell.....	Plover.....	do.....	May 28	Oct. 12	Sandy.....	1.35	.....	15.18	12.03	79.3	Hog manure and ashes.
219	George Truesher.....	do.....	do.....	June 4	Oct. 17	Sandy loam.....	.97	10,800	16.66	11.99	71.9	Unmanured.
220	James Wilson.....	Stevens Point.....	do.....	May 20	Oct. 8	do.....	.87	14,400	13.82	10.64	77.0	Cow manure.
221	William Gliese.....	do.....	do.....	June 15	Oct. 23	Black loam.....	2.17	42,150	16.32	11.92	73.1	Unmanured.
	Average.....						1.53	25,055	15.55	11.56	74.3	
222	John Spicker.....	Burlington.....	Racine.....	May 12	Oct. 24	Sandy.....	1.48	.....	16.75	13.91	83.1	Unmanured.
223	Adam Apple.....	North Cape.....	do.....	May 1	Oct. 10	Black sandy.....	3.53	.....	17.88	14.20	79.4	Do.
224	W. J. Hansche.....	Racine.....	do.....	May 9	Oct. 13	Heavy soil.....	1.62	21,038	19.00	15.53	82.9	
	Average.....						2.21	21,038	17.88	14.41	80.6	
225	Edw. Roberts.....	Buck Creek.....	Richland.....	May 27	Oct. 7	Timber soil.....	.77	37,785	16.15	12.40	76.8	Do.
226	do.....	do.....	do.....	May 27	Oct. 28	Loam.....	1.52	32,440	15.12	10.63	71.9	Do.
227	G. A. Casswell.....	Lone Rock.....	do.....	May 25	Oct. 13	Sandy.....	2.45	.....	14.70	11.20	76.3	Do.
228	W. T. Cass.....	do.....	do.....	May 19	Oct. 31	do.....	.55	.....	17.65	15.06	85.4	Do.
229	C. E. Jaquish.....	Neptune.....	do.....	May 15	Oct. 12	Clay loam.....	3.35	8,000	15.28	11.04	72.3	Cow manure.
230	C. M. Porter.....	Richland Center.....	do.....	May 19	Oct. 14	Clay.....	2.62	.....	15.35	11.60	77.5	Unmanured.
231	G. Walls.....	Rock Bridge.....	do.....	May 17	Oct. 16	Loam.....	2.18	.....	16.18	11.81	77.9	Do.
232	J. M. Clark.....	Viola.....	do.....	May 10	Oct. 10	Sandy loam.....	1.85	25,134	16.75	11.88	70.9	Do.
	Average.....						2.06	25,840	15.77	11.95	82.1	
233	G. W. Dawson.....	Beloit.....	Rock.....	May 23	Oct. 20	Sandy loam.....	.98	11,320	18.38	14.49	78.8	Do.
234	E. D. Wheeler.....	do.....	do.....	May 30	Oct. 7	do.....	1.62	.....	17.88	13.96	78.0	Manured.
235	John Tinker.....	Clinton.....	do.....	May 10	Oct. 15	Mack.....	1.07	.....	14.48	11.18	77.2	Unmanured.
236	J. Kimball.....	do.....	do.....	May 5	Oct. 29	Prairie.....	.87	40,000	17.70	13.19	78.0	Do.
237	E. G. Snyder.....	Clinton Junction.....	do.....	May 29	Oct. 17	Black loam.....	1.08	.....	16.05	12.01	74.9	Do.
238	J. Wadsworth.....	Evansville.....	do.....	May 20	Oct. 13	Sandy loam.....	1.48	.....	17.35	13.38	77.1	Do.
239	F. D. Reed.....	do.....	do.....	May 20	Oct. 10	do.....	1.35	.....	15.98	12.72	79.6	Do.
240	N. A. Austin.....	do.....	do.....	May 7	Oct. 15	Black loam.....	1.62	14,016	19.65	15.69	79.8	Do.
241	A. Shumann.....	Hanover.....	do.....	May 16	Oct. 17	Loam.....	2.58	.....	14.92	11.37	76.2	Do.
242	Fred Burton.....	Janesville.....	do.....	May 16	Oct. 20	Black lime.....	1.27	.....	16.42	12.75	78.5	Do.
243	E. L. Bingham.....	Milton.....	do.....	May 29	Oct. 1	Sandy loam.....	1.21	16,000	14.35	11.27	77.6	Do.
244	D. Walsh.....	do.....	do.....	Apr. 24	Oct. 24	Prairie loam.....	1.73	.....	13.060	13.15	73.4	Hog manure.
245	W. H. Greenman.....	do.....	do.....	May 26	Oct. 20	do.....	3.23	36,238	17.65	12.95	77.0	Unmanured.
246	G. C. Austin.....	do.....	do.....	May 26	Oct. 27	Loam.....	3.17	.....	15.10	10.87	72.0	
247	G. B. Mackey.....	Milton Junction.....	do.....	June 9	Oct. 19	Prairie.....	.75	22,522	17.46	13.34	76.4	

248	C. J. Capman.	do	do	May 30	Oct. 28	Light black	4.17	27, 110	16.73	12.83	78.3	Do
	Average						1.76	22, 783	16.77	12.82	76.4	
249	R. Searle	Baldwin	St. Croix	May 23	Oct. 20	Loam	1.43	49, 558	17.88	14.20	79.4	Do.
250	Clark Greenfield	Boardman	do	May 27	Oct. 17	Loam	4.53	.....	12.12	7.84	64.7	Hog manure.
251	G. F. Hausen	Der Park	do	May 12	Oct. 10	Clay	1.13	60, 400	16.05	11.85	73.9	Unmanured.
252	S. A. Raymond	Hersey	do	May 3	Oct. 8	Loam	1.72	41, 600	16.05	12.61	78.6	Do.
253	Geo. Martin	Hudson	do	May 20	Oct. 10	Black sandy	2.95	.....	15.62	10.72	68.6	
254	W. J. Hennesey	Jewett Mills	do	June 10	Oct. 20	Clay loam	.83	.....	17.22	14.18	82.4	Do.
255	P. L. Larson	Star Prairie	do	May 20	Oct. 22	Clay	.75	7, 285	20.66	14.61	70.7	
	Average						1.91	39, 711	16.51	12.29	74.4	
256	Adolf Kraft	Karaboo	Sauk	June 4	Oct. 12	Black soil	1.25	69, 944	17.12	13.68	79.9	Cow manure.
257	H. J. Farnum	Prairie du Sac	do	May 19	Nov. 15	Loam	1.72	45, 740	19.90	15.77	78.8	Barnyard manure.
258	W. H. Schutte	Reedsburg	do	May 20	Oct. 22	Clay loam	2.25	26, 880	17.38	12.89	74.2	Do.
259	Albert Ayres	Hayward	Sawyer	May 9	Oct. 7	Black sand	1.74	47, 521	18.13	14.11	77.8	Horse manure.
	Average						2.88	52, 200	14.48	10.69	73.8	
260	W. H. Carpenter	Aniwa	Shawano	June 10	Oct. 12	Loam	1.13	42, 690	17.12	13.24	77.4	Do.
261	L. S. Rouse	Belle Plaine	do	May 13	Oct. 21	Sandy	1.58	23, 720	16.10	12.36	76.8	Do.
262	J. C. Campbell	Cecil	do	June 7	Oct. 25	Sandy loam	1.30	54, 230	21.28	16.52	77.7	Do.
263	Felix Barth	Laney	do	May 13	Sept. 28	Clay loam	1.58	31, 920	15.28	11.19	73.3	Manured.
264	G. Thomas	Shawano	do	May 13	Oct. 10	Sandy	1.62	.....	11.42	7.12	62.4	Do.
265	J. C. Roper	Wellenberg	do	May 23	Oct. 12	Sandy loam	2.43	.....	13.28	11.73	77.2	Unmanured.
	Average						1.82	38, 140	16.08	12.04	74.9	
266	A. R. Munger	Boltonville	Sheboygan	May 23	Oct. 15	Clay	2.82	7, 600	15.62	12.23	78.3	Do.
267	Mrs. Laycock	Cascade	do	June 20	Oct. 10	do	2.30	21, 409	15.85	12.00	75.7	Do
268	P. Doane	Oostburg	do	June 15	Oct. 20	Heavy clay	2.32	.....	16.85	12.17	72.2	Stable manure.
269	Theo. Haney	Palmyra	do	June 8	Oct. 23	Sandy	2.13	17, 896	18.14	14.97	82.6	Do.
270	N. Crumrey	Plymouth	do	May 18	Oct. 9	Black muck	2.27	.....	13.38	9.38	70.0	Unmanured.
271	L. Rehm	do	do	May 19	Oct. 8	Muck	2.32	.....	13.30	9.46	71.1	Do.
272	N. Fisher	do	do	May 23	Oct. 10	Sandy loam	2.50	24, 000	13.78	10.04	72.9	Stable manure.
273	L. Helmer	do	do	May 16	Oct. 9	Dark clay	2.02	.....	11.34	7.37	67.7	Unmanured.
274	E. Schierstedt	do	do	May 18	Oct. 8	Sandy loam	1.43	.....	16.95	12.80	75.5	Do.
275	O. Schneider	do	do	May 28	Oct. 9	Black muck	.80	.....	14.00	9.40	67.4	Barnyard manure.
276	L. Knauer	do	do	June 8	Oct. 8	Sandy loam	1.20	.....	13.78	8.87	67.2	Cow manure.
277	O. Bergeman	do	do	June 14	Oct. 7	Dark clay	.83	.....	17.45	12.70	72.8	Unmanured.
278	Joseph Seil	Scott	do	Apr. 15	Oct. 10	Light loam	1.73	8, 400	14.57	10.22	70.2	
279	N. Weingartner	do	do	May 14	Oct. 13	Clay	3.47	105, 415	15.00	10.69	71.3	Barnyard manure.
280	H. M. Groeneveld	Sheboygan Falls	do	Apr. 28	Oct. 15	Black loam	1.98	12, 000	14.20	10.42	73.4	Unmanured.
281	A. X. Hyatt	do	do	May 20	Oct. 20	Muck	3.10	83, 640	16.50	11.59	70.3	Barnyard dirt.
	Average						2.08	24, 992	15.10	11.16	73.2	
282	Thos. Brehm	Chelsea	Taylor	June 10	Oct. 12	Garden soil	2.68	5, 260	16.82	11.92	70.9	Manured.
283	Geo. Hartung	Little Black	do	May 20	Oct. 7	Sandy clay	.72	.....	13.62	11.63	74.5	Cow manure.
284	J. Julius Frank	do	do	May 18	Oct. 10	Black clay	1.18	32, 000	16.90	13.63	80.7	

Sugar beets in Wisconsin, season of 1891, arranged alphabetically according to counties—Continued.

No.	Name of grower.	Post-office.	County.	Time of planting.	Time of harvest- ing.	Soil.	Average weight of beets.	Yield per acre.	Solids in juice.	Sugar in juice.	Purity coeff- icient.	Remarks.
							<i>Pounds.</i>	<i>Pounds.</i>	<i>Per cent.</i>	<i>Per cent.</i>		
285	Geo. Schuhart.....	Little Black	Taylor.....	May 8	Oct. 13	Black clay.....	1.67	37,000	18.82	15.02	80.0	Unmanured.
286	Ferd Lindow.....	Medford.....	do.....	May 10	Oct. 7	Sandy clay.....	1.91	.....	17.11	13.62	79.6	Cattle manure.
287	F. Helwig.....	do.....	do.....	June 10	Oct. 6	Loam.....	1.58	.....	15.81	12.78	80.8	Unmanured.
288	Fred. Moser.....	do.....	do.....	May 12	Oct. 8	Clay.....	1.20	23,200	16.45	13.30	80.9	Stable manure.
289	F. H. Wehmaun.....	do.....	do.....	May 6	Oct. 12	Sandy loam.....	1.67	9,714	15.98	12.77	80.0	Stable manure.
290	F. L. Dietrich.....	do.....	do.....	May 14	Oct. 15	Heavy clay.....	2.92	.....	12.82	8.28	64.6	Cattle manure.
291	Jos. Erben.....	Stetsonville.....	do.....	May 15	Oct. 7	Loam.....	1.73	9,000	15.72	12.86	81.9	Do.
292	Jos. Reinolt.....	Whitlsey.....	do.....	May 20	Oct. 13	Sandy loam.....	.88	.....	17.00	14.59	85.8	Unmanured.
293	K. F. Hanel.....	do.....	do.....	May 30	Oct. 8	do.....	1.08	57,60	17.12	13.46	78.6	Cattle manure.
294	F. Wiltener.....	do.....	do.....	May 20	Oct. 3	Sandy humus.....	1.77	.....	17.00	12.64	74.4	Do.
	Average.....						1.54	17,505	16.39	12.81	78.2	
295	B. Tollefson.....	Eleva.....	Trempealeau.....	May 15	Oct. 15	Clay.....	1.98	.....	15.90	12.21	76.8	Straw manure.
296	P. H. Claussen.....	Frenchville.....	do.....	May 20	Oct. 27	Mild loam.....	1.58	24,752	17.55	15.03	84.2	Unmanured.
297	do.....	do.....	do.....	May 20	Oct. 27	do.....	1.13	41,216	18.48	15.57	84.3	Barneyard manure.
	Average.....						1.23	32,984	17.78	14.27	80.3	
298	J. T. Brinkman.....	Coon Valley.....	Vernon.....	May 20	Nov. 15	Heavy clay.....	3.65	13,200	15.56	11.40	73.2	Do.
299	J. P. Riley.....	Hillsboro.....	do.....	May 30	Oct. 15	Clay.....	1.05	.....	15.75	10.12	64.2	Unmanured.
300	J. B. Johnson.....	Newry.....	do.....	May 15	Oct. 13	do.....	1.58	.....	15.05	11.37	75.5	Do.
301	A. H. Rolfe.....	Rockton.....	do.....	May 16	Oct. 12	Clay loam.....	2.23	.....	13.50	9.29	68.8	Barneyard manure.
302	M. F. Hopkins.....	do.....	do.....	May 10	Oct. 14	do.....	1.35	26,354	16.28	13.49	82.9	Unmanured.
303	P. M. Randall.....	Sugar Grove.....	do.....	May 12	Oct. 15	Clay.....	1.92	22,651	15.80	12.80	81.3	Do.
304	Edgar Eno.....	Valley.....	do.....	June 1	Oct. 27	Sandy loam.....	1.13	.....	18.08	14.80	81.8	Do.
305	A. Newland.....	do.....	do.....	June 1	Oct. 27	do.....	1.82	.....	15.86	11.79	74.3	Do.
306	F. C. Clark.....	Victory.....	do.....	May 20	Oct. 17	Heavy clay.....	2.50	38,000	16.82	11.79	70.1	Do.
307	Harry Clark.....	do.....	do.....	May 25	Oct. 14	do.....	1.50	20,000	18.32	14.70	80.2	Do.
308	F. H. Buchanan.....	do.....	do.....	June 7	Oct. 31	Clay loam.....	1.78	22,860	16.38	13.56	82.8	Do.
	Average.....						1.96	25,511	16.13	12.19	75.6	
309	A. W. Arwood.....	Heart Prairie.....	Walworth.....	May 20	Oct. 31	Prairie loam.....	1.22	18,610	20.18	16.84	83.4	Do.
310	G. V. Weeks.....	Lyons.....	do.....	May 15	Oct. 14	Black muck.....	3.32	85,378	14.48	11.26	77.7	Do.
311	H. Larson.....	Sharon.....	do.....	May 26	Oct. 24	Clay loam.....	1.10	18,070	21.82	18.27	83.7	Do.
312	B. Lester.....	do.....	do.....	May 30	Oct. 20	Heavy clay.....	2.27	46,200	17.96	13.37	74.4	Do.
313	W. Zolchaut.....	Vienna.....	do.....	May 12	Oct. 16	Black soil.....	2.70	.....	15.40	11.10	72.1	Do.
314	J. B. Smith.....	Whitewater.....	do.....	May 20	Oct. 14	Sandy loam.....	2.35	34,944	15.40	11.61	75.4	Stable manure.

315	M. J. Bagley	do	do	June 10	Oct. 10	Clayey sand	2.53	51,200	13.95	8.84	63.4
316	H. H. Wade	do	do	May 28	Oct. 19	Burr oak land	2.80	39,204	14.32	10.88	76.0
317	W. MacDonald	do	do	May 9	Oct. 15	Prairie loam	3.72	16,227	14.92	10.82	72.6
	Average						2.45	38,729	16.49	12.55	76.1
318	A. Dahlstrom	Shell Lake	Washburn	May 21	Oct. 15	Clayey sand	.68	20,909	15.68	12.00	76.6
319	Wm. Row	Boltonville	Washington	May 15	Oct. 14	Clay	1.67	5,899	15.35	10.92	71.2
320	M. L. Barney	Hartford	do	May 13	Oct. 19	Clay loam	1.35	22,000	17.96	14.32	73.9
321	W. Meier	Nenno	do	May 11	Oct. 27	Clay	1.23	9,600	20.12	15.31	76.0
322	Sam. Salter	Salter	do	May 14	Oct. 12	Black loam	3.83	9,600	10.18	10.18	71.5
323	F. Van Rhuinen	South Germantown	do	May 16	Oct. 20	Sandy loam	11.87	48,000	20.78	17.64	84.9
324	do	do	do	May 16	Oct. 20	do	11.57	48,000	22.60	19.39	85.8
325	John Gebhardt	do	do	May 5	Oct. 23	do	1.88	19,035	13.80	13.80	72.5
326	do	do	do	May 5	Oct. 23	do	11.23	19,54	14.12	12.73	72.3
327	Geo. Gebhardt	do	do	May 15	Oct. 30	do	11.30	17.44	13.26	12.73	76.0
328	do	do	do	May 15	Oct. 30	do	11.78	18.38	14.56	14.56	79.3
	Average						1.67	26,700	18.55	14.35	75.7
329	H. T. Jeffrey	Colgate	Waukesha	May 21	Oct. 16	Clay	1.98	16.32	12.25	12.25	75.0
330	W. C. De Wolf	Eagle	do	May 11	Oct. 26	Sandy loam	2.13	16.82	13.45	13.45	80.0
331	J. J. Finney	Genesee	do	June 15	Nov. 4	do	31.27	16,020	21.06	16.25	77.3
332	W. D. Anstey	Hartland	do	May 10	Oct. 17	Clay	3.70	13.50	8.85	8.85	65.6
333	G. M. Duncroft	Menomonee Falls	do	May 11	Oct. 15	Clay loam	1.90	16.10	13.27	13.27	82.5
334	G. Greif	do	do	May 6	Oct. 20	Sandy loam	11.52	18.20	13.99	13.99	76.9
335	do	do	do	May 6	Oct. 20	do	11.50	19.76	15.38	15.38	77.8
336	F. Peardon	Ottawa	do	May 25	Nov. 4	Black sandy	2.13	16.02	10.52	10.52	65.6
337	M. Andree	Pewaukee	do	May 20	Oct. 20	Sandy loam	2.28	28,080	18.78	14.84	79.0
338	A. J. Fraser	Vernon	do	May 20	Oct. 29	Black loam	2.33	35,720	18.08	14.53	80.4
339	J. Bias	Waterville	do	May 20	Oct. 21	Black sandy	2.15	16.56	13.15	13.15	79.4
340	S. A. Baird	Waukesha	do	May 9	Oct. 13	Clay	3.53	8.94	8.94	8.94	66.0
341	J. Wright	do	do	May 20	Oct. 15	do	3.37	14.28	10.18	10.18	71.3
	Average						2.29	26,607	16.85	12.74	75.6
342	Geo. A. Phillips	Rear Creek	Waukegan	May 15	Oct. 19	Sandy loam	2.20	29,185	14.48	11.09	76.6
343	F. E. Koeller	Embarass	do	May 28	Oct. 15	Clay	2.33	13.85	11.85	11.85	75.5
344	D. Marshall	Manawa	do	May 20	Oct. 16	Rich loam	2.02	50,830	17.22	12.52	72.7
345	H. J. Teed	Marble	do	May 15	Oct. 17	Clay	1.33	17.22	14.05	14.05	81.4
346	Aug. Kussmann	Marion	do	May 14	Oct. 14	Sandy	2.35	15.58	12.31	12.31	79.0
347	F. Bohlman	New London	do	May 27	Oct. 13	Black loam	.88	22,216	14.0	10.76	76.9
348	W. Breimer	Readfield	do	May 16	Oct. 28	Sandy clay	1.72	16.60	12.39	12.39	74.6
349	Aug. Piddle	Symco	do	May 12	Oct. 20	Clay	2.73	8,160	17.14	13.14	76.6
350	R. H. Hall	do	do	May 11	Oct. 16	Sandy loam	.85	30,958	17.50	14.30	81.7
351	G. Williams	Waukegan	do	June 11	Oct. 19	do	.85	30,880	18.10	14.03	77.5
352	E. Townsend	do	do	May 29	Oct. 26	do	1.27	11,840	18.52	14.26	77.0
353	P. L. Van Epps	Weyauwega	do	May 10	Oct. 6	do	1.75	19,188	15.40	11.52	74.8
	Average						1.69	25,407	16.55	12.69	76.7

* Beets grown in Crawford County. † German seed from Queedimburg. ‡ Le Maire's Richest, from U. S. Department of Agriculture. § Beets somewhat wilted.

Sugar beets in Wisconsin, season of 1891, arranged alphabetically according to counties—Continued.

No.	Name of grower.	Post-office.	County.	Time of planting.	Time of harvest- ing.	Soil.	Average weight of beets.	Yield per acre.	Solids in juice.	Sugar in juice.	Purity coeff- icient.	Remarks.
354	C. A. Davenport	Aurora	Waushara	June 13	Oct. 22	Clay	1.35	78,408	16.20	Per cent. 10.75	66.3	Unmanured.
355	J. G. Reinke	Pine River	do	June 1	Oct. 1	Sandy	1.83	43,560	15.45	12.48	80.8	Hen manure.
356	E. Post	Wautoma	do	May 25	Oct. 22	Sandy loam	1.15	30,492	18.55	14.61	78.7	
	Average						1.44	50,820	16.77	12.95	76.3	
357	J. L. Knott	Allen	Winnebago	May 2	Oct. 20	Clay loam	2.00	5,200	18.14	13.94	76.9	Barnyard manure.
358	J. Bareis, Jr.	Eureka	do	May 4	Oct. 17	Sandy loam	3.05	43,906	13.95	10.92	78.3	Unmanured.
359	W. W. Noble	do	do	May 10	Oct. 17	Black soil	1.48	36,588	16.22	12.58	77.5	Do.
360	I. W. Tobey	Neshk	do	Apr. 20	Oct. 16	Clay loam	.78	38,080	19.72	14.69	74.5	Barnyard manure.
361	E. Fuller	do	do	May 10	Oct. 10	Sandy loam	*3.88	24,000	18.20	13.64	75.0	Unmanured.
362	G. Ods	do	do	May 20	Oct. 25	Clay loam	*1.58	.....	17.70	11.05	62.4	Manured.
363	F. H. Teutmeier	Omro	do	May 20	Oct. 14	Sandy loam	1.07	.....	14.48	10.39	71.5	
364	A. Shelton	do	do	May 11	Oct. 10	Clay loam	.88	26,136	18.78	13.50	82.7	
365	M. E. Green	Oshkosh	do	May 19	Oct. 18	do	1.83	23,522	16.78	12.27	73.2	Unmanured.
366	J. F. Miller	Picketts	do	May 21	Oct. 16	Rich loam	1.75	41,328	14.70	11.16	76.8	Do.
367	P. Tenneson	Winnebago	do	May 20	Oct. 17	Red clay	1.10	12,800	18.15	13.75	75.8	
	Average						1.67	27,961	16.98	12.72	75.0	
368	F. E. Taylor	Centralia	Wood	May 10	Oct. 18	Clay	1.48	12,960	17.28	13.80	79.9	Barnyard manure.
369	J. S. Lindahl	do	do	June 10	Oct. 21	Heavy clay	3.28	63,220	16.90	11.82	73.9	
370	W. S. Miller	Grand Rapids	do	May 15	Oct. 10	Sandy loam	1.35	.....	15.40	12.38	80.4	Ashes.
371	C. H. Wood	do	do	June 5	Oct. 10	Sandy	1.62	.....	16.62	13.65	82.1	Unmanured.
372	Mrs. R. B. Tarbox	Pittsville	do	May 18	Oct. 17	Heavy clay	3.00	26,880	17.14	13.19	77.0	Barnyard manure.
373	E. Letwan	Vesper	do	May 20	Oct. 15	Clay	3.30	.....	14.58	10.76	73.4	Do.
	Average						2.34	34,353	16.17	12.60	77.8	

* Beets somewhat wilted.

We give below extracts from the remarks with which the different farmers accompanied the description of the beets sent in for analysis by them. The figures refer to the numbers in the preceding table:

3. Seed did not come up for a month after planting, June 14.
13. This variety does not yield as well as No. 12, but seems to mature earlier.
14. Cutworms ravaged beets badly when they came up first.
16. No rain from April 25 to June 14, and none from July 1 to September 30, to wet the ground more than about an inch; in fact it has been the driest season that the oldest settler has seen.
19. Some insects or bugs hard on beets and rutabagas by side of them in the spring.
- 23, 24. Only one row harvested, hence the excessive yield.
30. I think in a good growing season I could get as many again from the same ground.
- 35, 64. The seeds lay in the ground for about four weeks before coming up.
54. Last crop grown on land wheat; the field was not manured for four years.
58. Harvested a great many beets that weighed 9 to 10 pounds.
62. Not more than two-thirds of a crop.
79. Cutworms destroyed fully one-half the plants.
80. Had the season been more favorable and they had received proper care and cultivation, the yield would have been three times as great.
81. The crop was nearly destroyed by cutworms.
85. This is not more than half a crop.
89. The like of the drought not seen in the State since 1865.
90. No rain for about three months to wet the ground.
92. I would rather plant potatoes and sell them at 25 cents a bushel and buy my sugar than to raise sugar beets.
97. Time expended planting, cultivating, and harvesting plat (one twenty-fourth acre), twenty-eight and one-half hours. (This would equal an expense of \$4.56 per ton of beets, valuing one hour labor for one man 10 cents, and the yield of beets 15 tons per acre; see further under No. 247.)
100. Some of the beets were entirely stripped of leaves by a black bug.
101. The beets seem to stand drought much better than other roots. Had turnips, carrots, etc., on same ground, and they are worthless. My cow relished them and gave a good flow of milk.
120. I think I could raise 40 tons per acre in good season.
143. I think I can raise 1,200 bushels to the acre.
154. It was too dry for the seed to sprout until June 15, and then insects gnawed the plants off. The plot was only half covered with beets.
156. Had some beets of 9 pounds weight.
160. There is not more than half the yield there would be in an ordinary season.
162. Judging from the very bad season here for this kind of crop, I think they would be a very profitable crop to raise for any purpose that they can be used for.
167. Several beets weighed 9 to 10 pounds.
191. The seed did not germinate for nearly a month after planting, and then so unevenly that a careful transplanting could not produce an even stand.
193. Never had such weather in the last ten years.
199. Seed came up about June 25.
225. Beets are better than other roots for cows giving milk. They keep through the winter as good or better than potatoes.
235. Can be grown as well as potatoes, but, like everything else, the labor beats the balance sheet.
242. I have no doubt but that beets can be profitably grown if the rows are put far enough apart so the greater part of the work can be done with a horse.
247. It required 22 hours 35 minutes time for one man to plant, hoe, cultivate, thin, dig, top, and put in the cellar. Size of plat, 4,620 square feet. (This would

equal an expense of \$1.42 per ton of beets, assuming cost of labor and yield as under No. 97.)

261. Obtained first premium at the county fair for the beets.

262. Beets were scarcely up by July 4; growth began about September 1.

266. Not more than 10 per cent of seed germinated, on account of season being so dry.

205. Cutworms killed a good share of the beets.

302. There was 1 pound of tops to 10 pounds of beets.

309. The season was unfavorable for most crops, nearly all summer being very dry. Corn did not do more than half.

311. I noticed a black bug an inch long from the middle of July to the last of August, which injured the leaves of the beets considerably. I have frequently noticed the same bug on potatoes. If you send me seed for next season I think I shall do considerably better, having learned some by experience.

317. During the hot weather in August swarms of black bugs, one-half an inch in length, went for the tops in places, making a clean sweep as far as they went, eating the tender part of the leaf, leaving nothing but the limb. The bugs remained about three weeks; the damage retarded the growth of the beets for a short time, but they recovered entirely from the injury and most of them are quite large now. * * * Am satisfied sugar beets would do well in this neighborhood. * * * My experience this year shows they are determined to grow in the soil here no matter how long the drought or how many bugs they have to contend with.

330. For growing beets manure year before planting, to have manure well rotted.

342. The season being very dry the seed did not come up until June 25. * * * The seed being of good quality made a good stand. Had the season been favorable the yield could have been at least one-half more. Considering the very dry season I think sugar beets withstand the drought better than the Yellow Tankard mangel planted along side of them, the beets being deeper rooted.

351. The season has been the driest that I ever experienced in Wisconsin. It is really wonderful that I got as good a crop as I have harvested.

352. I think a common season ought to double the yield.

353. The seed lay in the ground six weeks before germinating. With the same growing weather as in 1890 should have had twice the amount, for my land was far better than last year.

365. It has been an extremely dry season. Consider them almost a total failure.

From the tables of analyses we deduct the following statements:

Lowest analysis, 1891.....	per cent sugar in the juice..	7.12
Highest	do....	23.52
Average of 373 analyses.....	do....	12.56
Average estimated yield of beets per acre	pounds..	31,090

The average per cent of sugar in the juice for this year came at 12.56. This may be considered a fair average, although there is evidently considerable room for improvement. The average for Germany during the past season is estimated at 12.55 per cent. Last year the beets analyzed at this station (93 in all) averaged 12.46 per cent of sugar in the juice. Only eleven farmers sent in beets both years; the average of the samples furnished by these were, in 1890, 11.85 per cent; in 1891, 14.30 per cent of sugar in the juice, or 2.45 per cent increase in 1891. This would tend to show that the main reason for the rather inferior quality of beets grown by many farmers lies in their unacquaintance with the sugar beet and its culture; excepting the eleven farmers who furnished samples both years, there were only a very few who had had any previous experience in growing sugar beets. Another reason lies in the fact that the farmers are apt to send in the largest beets grown, thinking that the larger beets they can grow the better; doubtless the analyses given in the above table are

lower in a large number of cases than truly representative samples would have shown.

Fifteen counties furnished beets analyzing on the average above 13 per cent of sugar in the juice; beets analyzing on the average above 14 per cent were received from the following counties: Door, Green, Jefferson, Lincoln (only one analysis), Pepin, Racine, Sauk, Trempealeau, and Washington. These counties do not belong to any single section of the State, but are scattered all around, in the western, southern, and northeastern portion of the State. This would indicate that successful sugar-beet culture with us is more a question of skill in growing than a question of soil. In any part of the State there is soil well adapted to sugar-beet culture; what is wanted is farmers who understand the cultivation of the beets, and enough of them within a limited area to furnish a sufficient quantity of beets to supply a beet-sugar factory with 200 to 300 tons of beets daily for a campaign of about three months. This means the product from not less than 1,500 acres of land in an average year. Whenever these conditions are present, beet-sugar factories will be established in our midst; capital will doubtless be ready to invest as soon as there is any prospect of successful outcome. But it would be simply throwing away a fortune to enter upon the undertaking with no certainty of the supply of beets. A modern beet-sugar factory will cost at least \$150,000; before beginning on the enterprise all conditions must therefore be carefully studied; the question of supply of beets is perhaps the most important of these. The results of the work done by this station during the past three years indicate that Wisconsin can grow beets in sufficient quantity and of good percentage of sugar; if this is correct, manufacturing of beet sugar will be a success with us when enough beets can be obtained to supply a beet factory.

Wyoming.—Fifteen samples were received from this State, of which 9 came from Albany County. The mean results from this county show 14.32 per cent of sugar in the beet, with an average weight of 7 ounces. The best results, all things considered, from the State are from Crook County, although only three samples were sent, showing 13.77 per cent of sugar and an average weight of 16 ounces.

In closing these remarks on the data obtained from the different States and Territories, it may be well to call attention to the fact of the remarkable extent of the area in the United States in which sugar beets of fair richness can be grown. In Bulletin 27, from theoretical considerations, a map was given showing practically where in the United States beets of exceptional richness could be grown. At the time of the publication of this map it was distinctly stated that there would be doubtless many localities without the boundaries of the proposed area in which excellent beets could be produced. The experiments, which have now been carried on for two years, show that the limits of beet-culture for sugar-making purposes are even wider than those intimated before.

Beets of fair quality have been grown as far south as Texas, and it is now believed that on most of the high plateaus of the central western portion of the United States beet-culture can be practiced with profit, especially where irrigation is possible. On account of the value of lands which are reclaimed by irrigation it is highly necessary that some crop should be grown which will pay for the intensive culture, and nothing better than the sugar beet can be recommended for this pur-

pose. It has been thoroughly demonstrated by the experiments carried on by this Department, that sugar-beet culture is possible in this country, and it only remains for the farmers of the country to indicate a willingness to grow the beets to secure the rapid development of our beet-sugar industry. The education of the farmers in this direction will doubtless be slow, but there is no reason to doubt its success. There is abundant capital in the country waiting to embark in the manufacturing part of the industry whenever it can be assured of a sufficient quantity of raw material for its operations.

BEET-SUGAR EXPERIMENT STATION AT SCHUYLER, NEBR.

Impressed with the necessity of securing in this country experimental tests of the most scientific methods of cultivating sugar beets and producing seed therefrom, I was directed by the Secretary of Agriculture in autumn of 1890 to visit Nebraska and other States with the intention of selecting a site for the establishment of such an experimental station.

The reasons which led to the selection of Nebraska as the State in which this station should be established were the fact that already a beet-sugar factory had been erected in that State and others were in process of erection, and that in its soil and climate it seemed to present a favorable locality in which to try the experiments, which, when finished, might prove of the greatest advantage to all parts of the country. The location of the station on the Pacific Coast would have placed it too far away to secure the personal control on the part of the Department which seemed to be necessary to success, while, had it been established farther east and north, it would not have so well represented all the points of soil and climate of the northern central portion of the country, in which the farmers seem to be most interested in beet-culture. Many localities were found in the State of Nebraska, and, as a result of personal inspection, two sites were favorably recommended for the location of the experiment station. The first of these was near Norfolk, in the northeastern part of the State. At this place a beet-sugar factory was in course of construction, and the people not only of the town but of the whole country were thoroughly aroused to the importance of a careful study of the beet-sugar industry. A favorable location was also offered for the establishment of the station at a distance of about a mile and a quarter from the location of the beet-sugar factory. The second place recommended was near the town of Schuyler, where two or three different plots of ground were offered, each of which seemed to possess some advantages. The Secretary finally selected Schuyler as the site, leaving the particular location in the vicinity to be determined afterward. The work therefore which is carried on at Schuyler must not be taken to represent the interests of Nebraska alone. Those interests are amply provided for by the excellent investigations of the State

station at Lincoln. Our work is to be taken for the advancement of the beet-sugar industry in general, and it has been carried on in a locality as nearly central as possible.

The plat of land which was finally selected was, in general, the best adapted to the purpose. No piece of land could lie more favorably for an experimental station. It has a gentle slope toward the south, and yet is practically level, but with a sufficient difference in altitude between its southern and northern portions to give excellent natural drainage, and yet not sufficient to produce washing during heavy rains. The soil is a deep sandy loam, and the only objection to it was that it was practically a virgin soil. Part of it had never been plowed, but the whole of it had been closely pastured for several years, so it was not exactly of the nature of the virgin prairie. The only fear entertained in selecting this piece of land was that the beets would grow to a remarkable size and be deficient in sugar content. This, however, as will be found in consulting the experimental data, was prevented by close planting, which kept the beets down to below normal size and secured in them a normal development of saccharine matter.

Being unable to give my personal supervision to the work of the station, it was placed in charge of Mr. Walter Maxwell, who brought to his work a large experience in farming and a thorough comprehension of the nature of the problems to be investigated. The scope and extent of the work was thoroughly explained to Mr. Maxwell before his departure to take charge of the station, and the thoroughness with which he carried out the instructions in the conduct of the work will be more clearly perceived by a perusal of his report, which follows.

During the planting season I spent some time at the station, and also during the analytical season.

Seed of the best European varieties was especially imported for the purpose of starting the crop for the first year, and in all cases an excellent stand was secured, although the conditions for germination were somewhat unfavorable. At the time of planting, the earth was remarkably dry, and continued so until near the end of May, after which time a period of exceptional humidity prevailed, accompanied by repeated and heavy rainfalls.

In spite of these unfavorable climatic influences, however, a good stand was secured in all the plats from planting 15 to 20 pounds of seed per acre. The general scope of the work may be outlined as follows:

In the first place, it was proposed to thoroughly prepare the soil in the best approved manner. Fortunately, on account of the land having been closely pastured, the sod was plowed without difficulty. The plow was followed by a subsoiler and the soil thus loosened to a depth of from 15 to 17 inches. No difficulty whatever was experienced in securing a perfect tilth of the surface and an excellent seed bed. Not willing, however, to trust the first year's experiments to a soil so wholly

virgin in its nature, an additional plot of land was rented which had been several years in cultivation, and this was prepared in the same manner for the reception of the seed. A beet of uniform size and proper shape, with a single tap root, can not be secured until the ground is loosened to a sufficient depth to allow the normal growth of the plant. If the tap root strikes a hard piece of earth at a depth of from 7 to 9 inches, it is naturally deflected in its course, or extra roots are formed and the beet becomes misshapen and tends to grow above the surface of the soil. There is, therefore, in beet culture an absolute necessity of securing a soil loosened to a sufficient depth to allow the tap root to penetrate easily from 15 to 17 inches.

Attention should also be called to the methods of planting and the times of planting. It was decided to illustrate the effect produced by planting at different periods, beginning as early in the season as practicable and continuing until late in the spring. By reason of the peculiar climatic conditions, however, which have been mentioned, namely, the very dry April and May, the full effect of this experiment could not be determined, as the beets practically all started to grow at the same time, near the end of May. It will be necessary, therefore, to repeat such experiments as these in regard to time of planting for several years in order to determine fully the effect of early and late planting on the crop as a general rule. It will be found, no doubt, that there are many soils where early planting will prove more advantageous, while, on the contrary, many others will be found where the late planting will be the most successful. In the absence, therefore, of any experimental data of a reliable nature on this matter it will be best for sugar-beet planters who are raising beets for commercial purposes to practice early, medium, and late planting in order that they may have at least a portion of their crop suited to the season, whatever it may prove to be.

In such a climate as Schuyler there is, of course, a liability to late frosts as well as early freezes, so that all these matters should be taken into consideration in regard to the time of planting.

In regard to the manner of planting, I think it sufficiently demonstrated that nothing is superior to the method of drilling which we practiced. We found that it was an easy matter to determine the number of pounds of seed dropped per acre by tying a bag under the nose of the drill and running it back and forth over a hard road through a distance which would correspond to one-eighth or one-quarter of an acre. The bag which had secured the seed which was deposited by the drill was then removed and the amount of seed weighed. By this method we had no difficulty whatever in adjusting the drill to plant any quantity of seed required. If the experience of one season should prove of any value, then the amount of seed which we used during the past season, namely, about 17 pounds per acre, was entirely sufficient.

In regard to the depth of planting also great care should be exercised. We endeavored to have the seed deposited about 1 inch under

the surface of the earth. The beet plant, on germinating, is extremely delicate and will not force itself through a deep layer of earth; especially is this true if, subsequent to the planting and before the appearance of the plant above the ground, a heavy rain should fall, packing the earth down firmly on the seed. If one could be assured of the occurrence of very dry weather for a considerable period after planting, then depositing the seed at a greater depth would be advisable, but it would be extremely dangerous practice to follow in a country where rains are likely to occur at any time. In localities where irrigation is practiced the amount of seed employed could be easily controlled, and in this case the seed could be deposited to a greater or less depth, according to whether the soil might be more or less moist.

The object of the work in cultivation was to show in a practical way how to secure a good stand of good, healthy beet plants at as nearly as possible even distances in the rows and to illustrate the method of culture. With the sugar beet the method of culture is essentially a superficial one; no deep plowing and stirring of the ground is required. On the contrary, the principles of beet culture look to a sufficient stirring of the ground to break up the capillary connection between the surface portions and the parts below to secure the proper tilth and pulverization of the surface and to prevent the growth of weeds and grass. These are the points which are to be secured, and any method of cultivation which accomplishes these ends will be sufficient for beet culture.

When the rows of beets are planted only from 12 to 15 inches apart, as in the case of some of our experiments, hand-hoe culture is the only practicable method. The rows are too near to permit the use of horsepower. When the rows are 18 inches apart, and greater distances, culture by means of horse hoes and cultivators is, of course, more economical than hand-hoe culture. Any good garden horse hoe which will stir the surface of the soil and at the same time protect the young plants from being covered up will be found useful in beet culture. In this respect it is but fair to call attention to the fact that culture of beets by steam or electric plowing may perhaps in the future be found to be the most economical. By the use of steam plows greater care can be exercised and greater or less speed can be imparted to the plow and absolute immunity from tramping the beets secured. This, however, is a matter for the future; meanwhile we may avail ourselves of the means of cultivation which can be procured. Quite a number of hand cultivators and horse cultivators and hoes were purchased from different implement dealers, and all of them, so far as we have been able to try them thoroughly, proved to be of a satisfactory nature.

Connected with the culture work, careful meteorological observations were conducted, in order that the climatic influences could be as thoroughly studied as possible. This leads to the observation that intercontinental areas, subjected as they are to great vicissitudes of climate, will perhaps not prove as favorable to beet-culture as the marine lit-

toral portions of the country. The influence of the sea water in modifying the climate of adjacent agricultural regions is too well known to need elucidation, and the extraordinarily favorable results reported from the Pacific coast with the beets grown by farmers in general are illustrations of this fact. So, also, the vicissitudes of climate are well known without consulting the meteorological data kept by the station at Schuyler during the past season. Prolonged periods of drought in such climates are followed by heavy and repeated rains; cold and hot days follow each other in rapid succession, not only in the spring and autumn, but even in the middle of the summer. It is thus rendered important to be able to be in a measure independent of climatic conditions, and therefore the proper preparation of the soil for the seed bed and the careful cultivation of the plants are more important factors in growing beets in intercontinental areas than in localities where the climatic conditions are more equable.

A striking illustration of such changes may be cited by referring to the fact that we had scarcely secured the beets selected as mothers in the silos at Schuyler, early in November, before the temperature fell below 0° F. By reason of these extremes of climatic conditions, also, it would be proper to call attention to the fact that the silos for preserving the mother beets during the winter season must be constructed with great care. It will be necessary to wait until the spring in order to determine how successful we were in preserving the beets during the winter which is just passing. Three different silos were made, varying in the principles of construction, in the hope of determining which of the methods of preservation would prove more successful. The attendant left in charge of the silos during the winter was also instructed to watch carefully the forecasts of the weather and add extra covering to to the silos whenever the temperature was expected to be extremely low. In the same way care was directed to be paid to ventilating the silos in periods of high temperature, which occur frequently, even during the winter, in that locality.

The success which attended these efforts at scientific culture were well attested by the magnificent appearance of the fields of beets during the latter part of the summer and as they approached maturity. The plots were seen to be absolutely free of weeds and grass, and in no place, in looking over the field, could the ground be seen. The beet leaves formed a complete covering and presented in every respect a most satisfactory appearance.

An outline of the principles underlying the analytical period of the experiments will indicate the general line of work.

First of all it was proposed to determine the yield in cleaned and topped beets per acre—that is, beets ready to send to the factory—for each period of planting and for each variation in the width between the rows, and the number of beets per acre. To secure this a carefully measured portion of each plot, under the conditions above mentioned,

was harvested, prepared as if for the factory and carefully weighed. At the same time the saccharine richness of each sample was to be determined. For this purpose no selection was made in regard to the beets, but each one was taken as it grew in the row until a certain number was selected, and each of these beets was analyzed separately. In the same plat an additional number of samples was taken in groups of ten, and each sample of ten beets was submitted to a separate examination. In this way the character not only of the individual beets was determined, but also the general character of the whole plat, being taken in groups of ten. Over 100 analyses per day were made from the time of the beginning of the harvesting, early in September, until the close of the analytical work in November. The results of these analyses are sufficiently set forth in the tables which accompany the report, and the details will not be mentioned here.

Attention, however, should be called to the fact of the great variation which will be noticed in individual beets, amounting to even as much as 2 or 3 per cent, in the quantity of sugar which they contain. It may be stated, therefore, that the results are given upon the composition of the expressed juice, as with so large a number of analyses it was impracticable to determine the sugar in the pulp of the beet itself. Inasmuch as the beets, however, were all submitted to analysis directly after they were harvested, so that no opportunity was given for loss by evaporation, it may be assumed that the percentage of sugar in the juice multiplied by 95 will give approximately the total quantity of sugar present in the beets.

In addition to the analytical work a careful selection was made of the different varieties of beets to be preserved as mothers. For this purpose the whole of the remaining plat, after the analytical data were obtained, was harvested and the beets selected for mothers which showed a normal size of from 500 to 600 grams and a perfect outline. All beets varying from normal size were rejected, as likewise were all of irregular surface, multiple roots, or deformed beets of any description. These beets were very carefully harvested and handled, the leaves only being cut away without injuring the attachment of the leaves to the stems of the beet, and were carefully preserved in silos.

In order to determine the character of the beets preserved in the silos, representative samples of mothers were taken for analysis and their weight and content of sugar determined. Another portion of exactly similar beets, as nearly as possible, was carefully weighed and separately preserved in the silo. The object of this was to determine in the spring the loss in weight which the beets might have experienced during the winter, and then, by determining the sugar in the samples thus preserved, any changes which the beets might have undergone in the silo can be determined. This, then, can be used as a standard in judging of the character of the mother beets when analyzed for planting.

It is the purpose of the Department to continue the experimental work with beets, should Congress grant money for that purpose, during the coming season on the following general principles:

The entire number of plats (thirty) in the experimental field will be so divided as to bring each plat into beets once in four years. The remaining plats will be planted in ordinary crops, so as to secure a trial of the principle of rotation. The beginning of this has already been inaugurated and a number of the plats has been planted in fall wheat and ry , while an additional number will be planted in maize, oats, spring wheat, and other crops during the coming spring. All of the plats have been properly fall-plowed and prepared for the spring planting, and those plats which are to be planted in beets have been thoroughly subsoiled. At the proper time it is proposed to open the silos and examine the mothers which they contain, first, in regard to the way in which they have been preserved; second, in regard to the loss of weight of the test samples of mothers, and, third, to subject each of the beets so preserved to analysis, rejecting all which fall below a given standard and planting the remainder for the production of seed of a high grade.

It is seen from the above outline of the work that it has been organized on the best approved principles for the illustration of the most scientific methods of producing beets. Not only will the work be valuable for the data which we obtain, but especially so for serving as a sample of what such work should be, which may be a guide not only to the farmers of the country who propose to enter beet culture, but also to those who may undertake the production of sugar-beet seed of high grade to supply the planters of the country. It is perfectly well understood that the farmers themselves will not be able to grow high-grade beet seed, on account of the great cost of analytical work which it involves, and if we produce our own seed in this country it will have to be done in the way indicated in the outline above given.

REPORT OF ASSISTANT IN CHARGE.

The further details of the experimental work are found in the report of the assistant in charge, Mr. Walter Maxwell, which follows:

DIVISION OF CHEMISTRY,
U. S. DEPARTMENT OF AGRICULTURE,
Washington, D. C., February 26, 1892.

SIR: I beg to submit to you a detailed report of the work accomplished by the sugar-beet experiment station of the Department of Agriculture at Schuyler, Nebr., in the year 1891.

Very respectfully,

WALTER MAXWELL,
Assistant in charge.

Prof. H. W. WILEY,
Director.

INTRODUCTORY.

The Department sugar beet experiment station, Schuyler, Colfax County, Nebr., is located near the junction of the narrow Shell Creek Valley with the broad plain through which the Platte River runs. The station is located 6 miles in a direct line north of the Platte River, and under the south slope of the terminating line of hills which separates the Shell Creek and Platte valleys. The situation is thus protected against the action of the north, northwest, and northeast winds, and has an ample exposure to the south, west, and east.

The station farm consists of thirty 1-acre plats and 1 acre of roads and borders.

Two tracts of land were offered for the use of the experimental station, including the one selected and a tract of equal size having a north exposure. In favor of the latter tract was the circumstance that it had been under cultivation for three years, while the selected tract at the beginning of this year was practically virgin prairie. Although the condition of the soil in the field exposed to the north appeared to be in a much more favorable state than the soil of the selected field for the immediate culture of beets, the equal richness and physical properties of the soils of the two fields and the climatic advantages of the field with the south exposure caused the selection of the latter as the location of the actual experimental station. However, as the new and crude state of the soil of the station field gave some doubt concerning the results of the first year's work, it was decided to grow beets in both the stated fields and provide against a failure in case the station field was too crude for immediate beet culture. To guard against confusion, the two fields will be designated: Field A, station field with south exposure; Field B, field with north exposure.

SOIL.

The soil of the station farm appears to be uniform with the prairie soil of the Platte Valley. It is a dark loam to a depth of $2\frac{1}{2}$ feet, resting upon a mixture $1\frac{1}{2}$ feet thick of clay and sand, and gradually going down to a pure sand at a depth of 5 feet, which meets the normal water level at a distance from the surface of $8\frac{1}{2}$ feet. It is a loose, easy-working soil, highly sensitive to variations in the temperature of the air, but very resistant of the action of the extremes of moisture and drought.

The chemical analyses of the soils gave the following results. No. 1 indicates the surface layer, 6 inches, and No. 2 the second 6 inches of the soils:

	Field A.		Field B.	
	No. 1.	No. 2.	No. 1.	No. 2.
Moisture	2.01	1.93	1.84	1.73
Organic matter	6.64	6.13	5.20	5.01
Insoluble residue	81.14	82.11	81.80	82.19
Ferric oxide (Fe_2O_3)	3.11	2.99	4.16	4.12
Aluminic oxide (Al_2O_3)	3.19	3.26	3.98	4.02
Calcium oxide (CaO)	0.72	0.68	0.52	0.44
Magnesia (MgO)	0.82	0.80	0.73	0.75
Soda (Na_2O)	Trace	Trace	Trace	Trace
Potash (K_2O)	0.59	0.61	0.57	0.58
Phosphoric acid (P_2O_5)	0.04	0.03	0.03	0.04
Sulphuric acid (SO_3)	0.004	0.006	0.008	0.003
Chlorine (Cl)	0.020	0.014	0.019	0.012
Carbonic acid (CO_2)	1.420	1.620	1.320	1.270
Total	99.794	100.180	100.177	100.165
Nitrogen	0.28	0.25	0.28	0.25

CULTURAL SEASON.

The work of preparatory cultivation began April 9, in Field B.

The late date at which it was decided to establish the station where it is now located prevented the adoption of the most advisable plan of cultivation, and the

work which should have been done in the fall was not entered upon until late in the spring.

April 9, 4 acres in Field B, which in the past year had been planted with corn, were plowed lightly and harrowed, and the cornstalks and roots, the latter being turned out by the plow, were gathered up and hauled off. Rains prevented any further operations until April 22, when plowing and subsoiling began. The ground, which had been freed from all cornstalks and roots, and which laid quite level, was plowed to a depth of $9\frac{1}{2}$ inches with an ordinary plow and the subsoiler followed to a further depth of 6 inches, so that the soil was broken up to a depth of 15 inches. The width of furrow taken by the plow was not more than 10 inches, in order to be sure that the lower soil was perfectly stirred by the subsoiler, the share of which was 9 inches broad. The land plowed each day was harrowed and dragged in the evening, to prevent it drying in a lumpy state and to lessen the loss of moisture.

April 26, the temperature of the soil in Field B was still too low for planting the seed, and it was left a few days, and 4 acres selected in Field A were plowed and subsoiled and treated further in the same way as had been done in Field B.

April 29, the seed bed of Field B, which had been quickly prepared by harrowing and dragging twice, and finally rolling after a third harrowing, had a temperature of 51° F. and the seed was put in.

Although the ground had plowed well, and each day's way was got down moderately fine with the harrow and drag, the condition of the seed bed was not satisfactory. There were no large clods, but instead of a thoroughly pulverized soil, such as can only be produced by the action of frost, the surface was made up of small clots or particles, rather than a mass of fine, moist mold.

The seeds were planted with a horse drill, taking one row. In the first place the ground was marked off in rows with a common wooden marker, making five lines at a time. The seed drill followed in each of the lines or rows left by the marker. The drill was set to deposit the seed $1\frac{1}{2}$ inches deep. The seed was planted at the extreme depth on account of the extremely drying weather which had set in, with a prospect of lasting for some time. After drilling the seed in rows at a distance of 17 inches apart the ground was again firmly rolled, in order to induce the rising of the moisture of the soil to the seed bed. The surface of the soil had become decidedly dry, and there was not moisture enough in the seed bed to produce immediate germination.

Six varieties of seed were planted, including—

- (1) Dippe Bros, Kleinwanzlebener.
- (2) Vilmorin White Improved.
- (3) Desprez & fils and Bulteau Desprez.
- (4) Lemaire père et soeur.
- (5) Ferd. Knauer.
- (6) Kleinwanzlebener (Élite).

The average amount of seed planted per acre was 17.6 pounds, the drill, with the same sized distributing wheel, delivering 18 pounds of the Kleinwanzlebener and Élite varieties, 17.2 pounds of the Vilmorin and Desprez, and 17.5 pounds of the Lemaire and Knauer varieties.

On May 5 and 6 the ground in Field A was prepared in the same way as in Field B, and on those days the seed was put in. The seed bed in Field A was in exactly the same state as in Field B—neither rough nor in that state of moist and pulverized mold which is essentially desirable. The seed was planted $1\frac{1}{2}$ inches deep, and in rows 18 inches apart. The temperature of the seed bed was 49.1° F. on the first day of planting—May 5. The amount of seed planted per acre was 16.5 pounds. The six varieties already specified were planted in Field A.

The special purposes of the planting of the large plats of the varieties of beets stated were, in the first place, to observe the results obtained from the soils and climate of the situation under the application of the best method of beet culture;

further, to note the behavior of the specified and well-established European varieties in new conditions of soil and climate; and finally, to produce and select beets of each of the named varieties for propagation uses. It may be found that the known varieties can not sustain the high standard of their characteristics in the new conditions to which they are being submitted, in which case it is considered that it will be possible and necessary to breed from the old varieties, by select crossing, new varieties which will be better adapted to the conditions and able to maintain a high standard of excellence.

In addition to the work on the large plats already described, a more minute plan of experimentation was laid out and confined to plats each 4 square rods in size, upon which three series of experiments were conducted:

(1) Distance experiments, or experiments with the purpose of observing at what distance the plants must be placed from each other to obtain the maximum results, expressed in weight of beets and sugar per acre. In the No. 1 plat the rows were placed only 12 inches from each other. In the other five plats the distances between the rows were respectively 14, 16, 18, 20, and 22 inches.

(2) Fertilizer experiments, or experiments in order to observe if any, and what, effects were produced by the application of ranging amounts of superphosphate to the beets in the virgin soil of Field A. The fertilizer was applied—

Plat 1.....	1 pound per rod, or 160 pounds per acre.
Plat 2.....	1.5 pounds per rod, or 240 pounds per acre.
Plat 3.....	2.0 pounds per rod, or 320 pounds per acre.
Plat 4.....	3.0 pounds per rod, or 480 pounds per acre.
Plat 5.....	4.0 pounds per rod, or 640 pounds per acre.

(3) Time experiments, or experiments for the purpose of showing the results of early and later planting, and to indicate the most advisable time for planting in such soil and climate. The planting of the plats was done as follows:

Plat 1.....	planted May 12.
Plat 2.....	planted May 19.
Plat 3.....	planted May 26.
Plat 4.....	planted June 2.

The preparation of the soil and seed bed of the small experimental plats was conducted in the same way as in the example of the larger plats. The seed was put in with a hand drill, the use of the horse drill being impracticable. The planting of the No. 1 series was done on May 11; of the No. 2 series on May 12 and 13; and of the No. 3 series as already given.

May 15, light cultivation was commenced in Field B. A part of the seed of most of the varieties had germinated and the plantlets were out of the ground sufficiently to mark the rows. Although the ground was still practically free from weeds, flat-hoeing was commenced, hoes with 8-inch blades being used, and the ground between the rows was thoroughly hoed up to 1½ inches of the plantlets. Most of the laborers were green, and had not seen a beet field before; but a short time was enough to show them the difference between taking long strokes and merely scraping the top, and short strokes, by which the surface of the soil was thoroughly moved to a depth of 1½ to 2 inches. Also the need of keeping so far from the rows as not to disturb the plantlets.

A very notable difference was observable in the six varieties in respect of the apparent vitality of the seed, as indicated by the per cent of seed which actually germinated. The "Vilmorin" variety not only came up one to two days before the other varieties, but almost the whole of the seed of that variety came up together. Next to the "Vilmorin" the "Élite" indicated the greatest vitality and soundness. Other of the varieties not only required more time to make a first appearance, but the seed kept coming up for five weeks even after a heavy rain, which indicated that seed of various ages had been put together in the samples. The actual comparative

vitality of the seed of the respective varieties is given in the following table, and shows the number of seeds out of one hundred which grew—

	Per cent.
(1) Élite, after 9 days	92
(2) Knauer, after 9 days	85
(3) Lemaire, after 9 days	87
(4) Desprez, after 9 days	88
(5) Vilmorin, after 9 days	95
(6) Kleinwanzlebener, after 9 days	90

By May 25 the plats in Field B, also in Field A, had been thoroughly flat-hoed, and some part of the former field a second time.

May 26, "thinning out" commenced in Field B. The Vilmorin variety, as already stated, had come up almost perfectly and nearly all the plantlets were large enough for "thinning." Not more than one-half of the seed of the other varieties had germinated, and, as a consequence, the "thinning out" had to be done twice, which not only increased the expense of that operation, but the plantlets were destined to be and remain of two sizes, the early plants from the first germination, and the later which germinated after the rains, and the evil of two sizes was to be seen throughout the season in the circumstance that the early plants made too large beets and the late plants too small.

From April 22 to June little rain fell, and not only was there no rainfall, but every day was warm, and the heat was accompanied by south winds, the velocity of which ranged from 15 to 20 miles per hour. The continuous drouth had a bad effect upon the early stage of the crop, which was planted in a soil quite unable, in consequence of the spring cultivation, to resist such a continuous spell of dry weather. At that period the future of the crop appeared threatened. On June 22 inches of rain fell, and the aspect immediately began to change.

The temperature of the soil during the germination season, and for the time included between May 1 up to the end of June, appears in the following table:

Field A.				Field B.		
Date.	Seed bed.	6-inch deep.	12-inch deep.	Seed bed.	6-inch deep.	12-inch deep.
<i>May.</i>						
Mean of—						
First week.....	49.5	50.0	50.0	49.5	52.0	52.5
Second week.....	59.0	57.0	55.0	57.0	55.5	53.5
Third week.....	69.0	64.0	56.0	68.0	62.0	55.0
Fourth week.....	64.0	63.5	64.0	61.0	61.0	61.5
<i>June.</i>						
First week.....	58.0	59.0	61.0	55.0	57.0	58.5
Second week.....	66.0	62.0	61.0	64.0	62.0	60.0
Third week.....	Not taken	74.0	69.5	Not taken	72.0	68.0
Fourth week.....	do	76.0	73.0	do	73.5	72.5

Before leaving the planting and germination period of the cultural season it will be specially in place to include certain particular observations upon the nature of the climate and the comparative adaptability of the soil to given climatic conditions. It has already been said that from April 22 until June 2 no rain fell. In such respect this has been an abnormal year. The normal rainfall for the month of May would be enough for cultural purposes were other physical conditions favorable. In point of fact, the rainfall for the month of May in the State of Nebraska is equal to or exceeds the rainfall for the same month in the beet-growing districts of Europe. And again, the temperature of the State of Nebraska does not vary materially in the mean from the temperature of the European countries, although the distribution of the temperature of Nebraska is subject to very much greater fluctuations. There is,

however, a factor in the climatics of that part of the Western and Northwestern and Southwestern States which appears to be much more potent than the considerations of temperature and rainfall, and that is the *winds* of those regions. That factor reduces any comparative statements of the temperature and rainfall of the State of Nebraska and the beet regions of Europe to a small value. A comparison of the Western States with the States on the Atlantic border in respect of the rainfall and temperature is upset by the same prevailing factor. The mean temperature for the month of May in Nebraska and the beet districts of Germany does not vary more than 1 to 2 degrees, being about 59° F in Nebraska and 58° in the European country. The actual effect, however, of the temperature of Nebraska, borne as it is upon the south wind at a high daily velocity (it is notable also that the wind rises with the sun, attains its maximum velocity in the midday, and moderates or goes quite down with the setting of the sun), is much greater than in localities where the air is generally in a more stagnant condition.

Again, the action of those winds upon the evaporation of moisture from the soil is very great. The seed bed, which at sunrise is soft and moist, after noon is dried out 1 to 2 inches, and the soil is actually hard and remains so until after sundown. The evaporation process occurs to such an intense degree that the rainfall of a moist and still atmosphere, of one-half to 1 inch per week in that season, would have a much smaller effect in the intense conditions of which we have spoken.

And yet, notwithstanding the conditions of which we have spoken, and which at first sight appeared unfavorable, the growth and vigorous appearance of the beet plants of the first germination were unmistakable. The plants not only looked vigorous, but they grew rapidly. That circumstance directed attention to the nature of the soil, for it appeared very evident that an adaptability in a high degree existed of the soil to the characteristics of the climate.

Following the observation stated, experiments were conducted with the purpose of ascertaining the power of the station soil to absorb moisture, both by capillarity and from the air; and, further, the capability of the soil to retain the moisture already absorbed. In order that the results of such experiments should be apparent they had to be made comparative, and samples of soil were obtained from the experimental stations of La Fayette, Ind., and College, Md., which samples were sent to us through the courtesy of Prof. Huston of the former and Maj. Alvord of the latter station. About 30 pounds of soil were contained in each sample sent to us, which represented the surface soils of the respective stations to a depth of 9 inches. A corresponding sample was taken of our own station soil. The samples were each pulverized, but not sifted, and laid very thinly upon boards exposed to the sun for several days until they were thoroughly sun dried. When quite dry, smaller samples were taken from each of the original ones and put into zink forms made for the purpose. The "forms" or vessels were 9 inches deep by 2 inches square. The bottoms were finely perforated, and before putting the soil into them square pieces of linen were damped and laid at the bottom inside in order to prevent any particles dropping through the perforations made for the capillary passage of water. When completed and filled with soil, care being taken that the latter should not be too loose or too compressed in the vessels, the latter were placed in a tub containing water one-half inch deep for twenty-four hours, or until each sample had taken up its maximum quantity of water. The sun-dried soils, with the vessels, were weighed before being put into the tub and immediately after being taken out, any drops attaching to the vessels being wiped off. The quantity of water taken up, or the absorptive power (by capillarity) of each soil, was thus determined.

Having thus come at the absorptive power of each soil, the next step was to determine the relative power of the soils to retain the water they had taken up under the same conditions.

A double series of vessels and samples of each soil were used, one part of which were placed under a normal exposure, *i. e.*, the vessels were put out in the field and

exposed to every change of weather, day and night, whilst the second part were kept in the barn, and thus kept from the sun and any rainfall. The data observed in the experiments are expressed in the following tables:

I.—TABLE SHOWING THE RELATIVE ABSORPTIVE POWERS OF THE SOILS.

Sample of soil.	Dry weight of soil.	Weight after immersion.	Weight of water absorbed.	Own weight of dry soil.
	<i>Grams.</i>	<i>Grams.</i>	<i>Grams.</i>	<i>Per cent.</i>
Maryland, I.	1,344	1,702	358	26.6
II.	1,414	1,777	363	25.6
Indiana, III.	1,409	1,795	386	27.3
IV.	1,426	1,818	392	27.4
Station, V.	1,304	1,735	431	33
VI.	1,330	1,868	438	32.9

II.—TABLES SHOWING THE RELATIVE RETENTIVE POWERS OF THE SOILS.

(a) *Series of samples placed in the barn.*

Samples of soils.	Per cent of water, of own weight of the samples, in the soils on—							
	July 13.	July 20.	July 27.	Aug. 3.	Aug. 10.	Aug. 17.	Aug. 24.	Aug. 31.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Maryland, No. I ...	26.6	25.4	17.7	16.1	13.4	11.3	9.8	8.1
Indiana, No. III ...	27.3	23.4	20	18.5	15.6	13.7	12.2	10.6
Station, No. V	33	26.6	22.5	20.4	16.8	14.2	12.2	12.5

(b) *Series of samples placed in normal exposure.*

Samples of soil.	Per cent of water, of own weight of the samples, in the soils on—							
	July 13.	July 20.	July 27.	Aug. 3.	Aug. 10.	Aug. 17.	Aug. 24.	Aug. 31.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Maryland, No. I ...	25.6	10.5	14.4	9.0	7.2	7.9	8.9	7.8
Indiana, No. IV	27.4	14.3	18.2	12.5	9	9.6	12.2	10.4
Station, VI	32.9	16.3	20	14.9	10.3	10.8	21.5	20

If the results of the station samples are taken as expressing 100, the relative capillary and retentive powers are as follows, based upon the data observed on August 31:

Soils.	Capillary or absorptive power.	Retentive power (in the shade).	Retentive power (normal exposure).
Station soil	100.0	100.0	100.0
Indiana	82.7	84.2	52.0
Maryland	78.7	64.8	39.0

Table I shows the great resorbtive power of the station soil, which means its great capillarity, as the moisture was taken up by capillary action.

Table II, series (a), indicates certain very important facts in the station soil, viz: First, that a portion of the very high per cent of water taken up by absorption is very rapidly given off, after which the rate of evaporation continues very gradual down to 12.2 per cent, when, on reaching that minimum, it commences reabsorbing

moisture from the air, whilst the Indiana and Maryland soils continue to lose in weight.

Series (b), of Table II, where the soils were placed in normal exposure, similar results are observed. The per cent of moisture in the station soil is constantly higher than in the other soils, and toward the end of August, when the Maryland and Indiana soils had become practicably insensible, the station soil was still highly sensitive in taking up and in retaining the moisture which it had received, as is shown by the data tabulated on August 31.

The data set forth in the tables illustrate the striking adaptability of the Nebraska soils to the Nebraska climate. They show the peculiar capability of those soils to withstand the usually bad effects of an excess of either rain or drought. They further indicate that, should the strong winds exercise an influence disturbing to the balance of the other climatic conditions, temperature, and rainfall, that influence appears to be effectually neutralized by the signal properties of the soil.

The "thinning out," it was said, commenced May 26. The plants were taken when they had four well-developed leaves. It appears very undesirable to disturb the young plantlets until they have reached the size stated. The rootlets have too frail a hold of the ground, and premature disturbance may more or less detach the plantlet from its soil connection.

The laborers employed were chiefly men who had never seen a beet field. Occasionally an old workman came who as a lad had been in the beet fields of Germany or Bohemia. The thinning out of the beets is the most particular operation of the cultural season, and with such laborers the work not only proceeded very slowly, but it was only possible at the beginning under constant practical supervision. Each man had to be shown, and repeatedly shown, until he could observe all the small points in the work. Small hoes with 3-inch blades were used, but the nervousness of the men, fearing they would not be able to manage the strokes, caused them at first to rely too much upon their hands.

In the hands of expert workmen the hoe not only enables more work to be done, but the work is done better. Not merely is the ground removed around and between the plants which are left, but the actual separation of the plants thinned out from the plants left is done with less damage to the latter when the hoe is used. A skillful workman will separate a bunch of plants better with the hoe than with the hand, excepting where there are very many small plants together. He will quickly with his practiced eye and hand separate the *best plant*, and by a manipulation of the hoe, slightly press the soil about it, and in the same act cut out the surplus plants, and in such a way that the standing plant remains even more firmly in its place than before. Such skillfulness requires much practice to acquire. Thinning out with the hand is apt to do more damage to the standing plants unless one hand is used to hold the standing plant, while the surplus plants are pulled out with the other hand; but that is an endless method. The ultimate form of the beet, and possibly other conditions, are directly affected by the act of thinning out. If the plants which are to stand are disturbed by the removal of the surplus plants so that the tap-root is severed from the soil at the point of the root, by which act the root-cap may also be injured or separated from the root, then instead of developing one tap-root with a system of very minute, fine, and fibrous root growth, several prongs will be put out and the form of the beet is wholly distorted. For example: Ten plants were drawn out of the soil with great care, and without apparently leaving any portion of the root in the ground. Those plants were replanted and grew to average sized beets. Each one of the ten beets, however, developed no tap-root, but instead several prongs or fingers, varying from two to five in number, and the natural form of each beet was distorted.

The "thinning out" of Fields B and A, the first time over, was finished June 11. On June 2, a strong rain fell, which brought away the seed still lying in the ground very

rapidly on account of the high temperature of the soil. The plants grew very quickly and the "thinning out" of all the plats, including the small experimental plats, was completed June 18.

The growth of the beets after the rain of June 2 and following days was phenomenal. This rapid growth, and the heavy and frequent rains, made the further acts of cultivation very difficult to do. In Field B the rows were only 17 inches apart, and the plants from the second period of germination being so far behind the early plants it was not practicable for the use of the horse hoe. The beets were hoed twice over after the final "thinning out," including the whole space between the rows and around the plants, and any "double plants" were separated. This work continued up to July 6, when the beets were "rowed up," that operation being done with the broad-blade hoes, the soil being hoed up on each side of the beets level with the top of the neck of the same. In that form, the beets hidden in soil and a trench made between the rows, the work was ended. In Field A, where the rows were 18 inches apart, horse labor was used in the light cultivation. After the thinning out, the horse hoe was used three times over, at such periods when the rains allowed. The beets were hoed twice with hand hoe amongst the plants and finally hoed up, the same as in Field B.

The cultivation of the small experiment plats was conducted in a way similar to what has been described. On those plats the seed came up thick and evenly. There was a full plant. The plants were thinned out exactly 6 inches apart in the rows, the distances being regulated by a 6-inch measure which the man carried for the purpose, the whole work on those plats being done by one skilled man. The plants were left about 6 inches apart in the rows on the large plats, but the same degree of exactness was not attained as upon the small plats. Further hoeing twice over and the final hoeing up completed the work on the small plats.

July 12 the cultural work of the season was done. The beets covered the whole ground, and, as far as cultivation could exercise an effect, there was no obstacle in the way of their progress.

The crop was now left to the climatic conditions, as it was advanced beyond reach of danger from other sources. And it will be in place here to observe the abnormal conditions of weather extending over the cultural season. It has been seen that little rain fell during the whole month of May, and normally the latter half of that month receives the usual spring rains, which continue into early June, and which are in the highest degree favorable to the cultural season of that period. On June 2 the first good rain fell since early in April. When the rains began they fell in torrents. In the month of June 12 inches were recorded, or nearly half an inch daily. On the 24th and 25th 8 inches fell in thirty-two hours. On the latter date the beets were not visible, the water standing from 6 to 8 inches deep over the whole tract of Field A. No immediate damage occurred to the crop, but the continuous dull weather, with a high atmospheric humidity (78.7 for June), frequent rains, and comparatively little sun, which conditions continued through July, caused eventually an unfavorable appearance. On July 25 it was observed that in the lower parts of the plats, where the deep green of the leaves had gone over into a sickly brown-yellow, the beets had commenced rotting. The decay commenced at the neck, on account of the moisture which was constantly resting on the foliage, for it was seldom dry. The decaying continued until the first week of August, when a period of dry weather, with hot winds, set in and saved the further damage of the crop. The decayed beets were dug up as soon as they were detected, but others which had merely commenced rotting recovered and put forth a second growth of foliage. The sugar content of those beets, however, remained abnormally low.

A table of the rainfall and temperature for May, June, July, August, September, and October is given, expressed in weekly means:

Date.	May.		June.		July.		August.		September.		October.	
	Rain.	Temp.	Rain.	Temp.	Rain.	Temp.	Rain.	Temp.	Rain.	Temp.	Rain.	Temp.
	<i>In.</i>	°	<i>In.</i>	°	<i>In.</i>	°	<i>In.</i>	°	<i>In.</i>	°	<i>In.</i>	°
First week...	0.14	50.8	2.65	61.8	3.16	67.7	.....	76.0	.....	62.4	3.25	43.6
Second week...	0.02	62.2	1.04	69.8	0.20	69.9	0.60	73.1	0.27	64.5	0.52	48.8
Third week...	0.77	60.8	0.21	69.1	1.47	72.7	1.54	68.3	.....	74.0	0.15	51.5
Fourth week...	0.45	62.4	7.64	73.6	1.88	69.4	0.08	63.3	0.57	59.7	.....	46.4
Mean rain...	1.38	.....	11.54	.....	6.71	.....	2.22	.....	0.84	.....	3.92	.....
Mean temperature...	.....	59.0	.....	68.4	.....	69.9	.....	70.2	.....	65.1	.....	47.6

Total rainfall for the given six months	inches..	26.61
Normal rainfall (for northern Nebraska) six months.....	do....	12.49
Total units of heat for the given six months.....		11,651
Normal units (for northern Nebraska) six months		11,548

The total heat units for the given six months are almost identical with the normal quantity found for northern Nebraska. The distribution, however, as we have in another place shown, was very far from the normal; May and September being several degrees too warm, and July, even in a greater degree, too cold.

ANALYTICAL SEASON.

The work of testing the beets analytically, in order to learn the results of the cultural season, opened early in September.

The station laboratory was completed and ready for use September 10.

The analytical work of the laboratory was conducted by T. C. Trescott, U. S. Department of Agriculture, assisted by C. B. Edson and others.

September 12 a general view of the crop was taken, expressed by the mean of several analyses of beets from each field, with the following results:

	Sucrose in juice.	Purity.
	<i>Per cent.</i>	
Field A.....	12.8	77.1
Field B.....	14.3	82.0

September 14 and 15 each of the six varieties in Field B was examined, and the mean of ten analyses of each variety gave as follows:

Variety.	Sucrose in juice.	Purity.
	<i>Per cent.</i>	
Elite.....	14.6	82.0
Knauer.....	15.7	80.2
Lemaire.....	13.2	77.0
Desprez.....	13.8	81.3
Vilmorin.....	14.3	.....
Kleinwanzlebener.....	14.7	.....

It is seen from the polariscope readings that the sugar present in the juice was very satisfactory. The juices, however, still appeared "green," and the general appearance indicated that, if the sucrose were approaching its maximum, there was room for improvement in the condition of the juices. The beets, moreover, had not fully taken on the mellow, golden-green color of the leaves indicative of maturity.

Analyses were made with ten beets selected from No. 1, small plat, on September 15, the mean of which gave 13.8 per cent sucrose in the juice.

No further work was done in the laboratory for another week, it appearing desirable to leave the beets alone, as they were gradually improving.

September 21 work commenced again in Field B, and upon a large scale. The beets of certain varieties appeared to have reached a state of maturity which made it possible to arrive at conclusions concerning the actual results of those varieties

expressed in weight per acre, the content of sucrose in the juice, and the total yield of sugar per acre, which data form the ultimate purpose and end of the work.

The work of determining the weight of beets per acre was done by selecting a given number of 3 square rods, according to the size of the whole plat, and ascertaining the weight of each square rod from the several parts of the plat and taking the mean as representing the 160-part of an acre. The details of selecting the square rods and the weighing of the beets were as follows: A wooden square made of light wood, was dropped down upon the place selected. That frame inclosed exactly 1 square rod. Every beet was taken up inside the square and none outside, so that each measurement was essentially precise. The beets were thoroughly cleaned; the tops, including the neck, were cut off with any coarse lateral roots, and weighed immediately. As already said, the mean of the square rods thus weighed upon each plat was taken as the acre unit.

The method of sampling a plat for determining the per cent of sucrose in the juice and the yield of sugar per acre was as follows: The length of the plats in Field B was between 30 and 40 rods, consequently the breadth of the plats was very small and the number of rows of beets few. Where the number of rows to a plat was less than 20 one average row was selected, and where the number exceeded 20 to the plat two average rows were selected. The selected rows were taken up in the following order: Either one hundred or two hundred beets, as decided upon, were selected in *twenties* from either five or ten different places in the rows, the places being so far apart as to give an actual average of the beets in the rows. Those beets were taken immediately to the laboratory and analyzed. Each one of those two hundred beets was analyzed individually, in order to afford not only an average, but also to observe the scale of variation in weight and sugar content of the single beets. In the next place, the whole of the beets remaining in the selected rows were taken up and brought direct to the laboratory and analyzed in "*tens*," *i. e.*, the juice of ten beets already weighed and ground up, was expressed and one polariscope reading made. From the individual beets the weight and sugar content of each one were found; and from the beets analyzed in *tens* the average weight, sugar content, and purity were obtained. The number of beets analyzed daily was from one hundred upwards, even to nine hundred daily, where the work was done in *tens*.

The weight of beets per acre (the samples being prepared for the scales in the manner already described) of the several varieties was as follows:

Field B.

Variety.	Date.	Pounds per square rod (mean of 3 square rods).	Pounds per acre.	*Tons per acre.
Elite.....	Sept. 21	257.0	41,120	20.56
Knauer.....	Sept. 23	266.0	42,560	21.28
Lemaire.....	Sept. 24	293.2	46,912	23.49
Desprez.....	Oct. 6	330.3	52,848	26.42
Vilmorin.....	Oct. 7	322.2	51,552	25.80
Kleinwanzlebener.....	Oct. 8	307.5	49,200	24.60

*All tons=2,000 pounds.

Field A.

Variety.	Date.	Pounds per square rod (mean of 3 square rods).	Pounds per acre.	Tons per acre.
Elite.....	Oct. 13	226.3	36,240	18.10
Knauer.....	Oct. 13	220.8	35,328	17.7
Lemaire.....	Oct. 15	229.7	36,750	18.4
Desprez.....	Oct. 15	266.3	42,608	21.3
Vilmorin.....	Oct. 19	263.3	42,128	21.1
Kleinwanzlebener.....	Oct. 19	281.0	44,960	22.5

The varieties "Elite" and "Knauer," in Field B, which were weighed first, and which were also the first to be tested on a large scale in the laboratory, appeared to have reached their maximum maturity. The Lemaire variety in the same field did not appear so thoroughly ripe, and the other varieties were still further off. Consequently, after September 24 the beets were left alone until October 6, no weighings or analyses being made during that interval.

The varieties in Field A were quite mature at the time the weighings were made.

The weighings given represent the maximum yield per acre of each of the varieties in both fields. The utmost precision was observed in each operation, and the results are given as being exact. Moreover the weighings were practically confirmed by the number of tons actually hauled from the fields when the whole of the beets were gotten up.

The analytical work, commencing September 21, began in Field B on the variety "Elite." The plat of that variety was comparatively small, so that 100 beets were analyzed individually and 800 in "tens," making 900 beets totally that were taken to represent the sugar value of the variety. The analytical data of the "individuals" are given in Table I. No selection of the beets was made, each one being taken seriatim in the row. The mean of analysis of 100 beets was 15.6 per cent of sugar in the juice. The data obtained from the analysis of the 800 beets in "tens" are given in Table II.

The results of the analyses of the "Elite" variety, September 21, were: Mean sucrose in juice, 15.7 per cent; mean purity, 84.6 per cent. The variety analyzed next in order was the "Knauer." From that variety 100 "individuals" and 620 in "tens" were analyzed. The mean percentage of sucrose in the juice of the 100 beets analyzed separately was 15.7. (The full table is omitted to economize space.)

The analyses of the 620 beets in "tens" are given in Table III.

The results of the "Knauer" variety, September 22, were: Mean sucrose in juice, 15.4 per cent; mean purity, 84.9.

September 25 the "Lemaire" variety was examined; 100 beets were taken for individual analysis and 600 for analyzing in "tens."

The 100 "individuals" gave the following results: The mean percentage of sucrose in the juice of the 100 separate beets was 13.9.

The 600 in "tens" gave the results recorded in Table IV.

The average results of the two sets of analyses the "Lemaire" variety on September 25 and 26 were: Mean sucrose in juice, 13.8 per cent; mean purity, 81.2 per cent. The "Lemaire" beets were not so mature as those of the "Elite" and "Knauer" varieties, and as the condition of the remaining varieties appeared still further from maturity no further analytical work was done until October 6. The weather of the previous ten or fourteen days had been highly favorable, and the less matured varieties were still improving.

From the cessation of the analytical work on September 26 up to the recommencement of the same, heavy rains fell. About 4 inches of rain were registered during that interval, an abnormally heavy precipitation for that season. The normal rainfall for October in that part of the State is very little more than 1 inch. Following the period of hot weather (the twelve days from September 13 to 25, the mean of the daily maximum temperature was precisely 90°), and falling upon soil whose temperature was over 70°, the effects were likely to be unfavorable and perhaps disastrous.

October 6 work was resumed in Field B, and upon the "Desprez" variety; 200 beets were analyzed individually, and the mean result of the analyses was: Sucrose in the juice, 13.5 per cent.

At the time (October 6) stated no beets of the Desprez variety were analyzed in "tens."

October 8 the Vilmorin variety was further examined, 200 beets being analyzed individually, showing a mean percentage of sugar of 13.8.

October 10 the Kleinwanzlebener variety was tested. One hundred beets were analyzed as "individuals," and the mean results showed 14.7 per cent of sugar.

A notable effect of the heavy rains and previous hot weather is observable in the sucrose readings of the last three varieties of beets analyzed. The falling off in the sucrose was seen by comparing the readings on the given dates.

Variety.	Sucrose, Sept. 15.	Sucrose, Oct. 10.
	<i>Per cent.</i>	<i>Per cent.</i>
Desprez.....	13.8	13.5
Vilmorin.....	14.3	13.8
Kleinwanzlebener ...	14.7	14.7

Analyses of those varieties were not made immediately before the rains, *i. e.*, about September 26; otherwise, if a comparison were made with the "Elite" and "Knauer" varieties, and it be supposed that the three former had made a similar increase in sucrose that the two latter varieties had done between September 15 and 25, then the actual falling off in sucrose in consequence of the rains would be much greater, which doubtless was the case.

Field B was left alone after the work already described, a sufficient number of beets of each variety being left for further analytical examination at a later period in the season, in order to observe whether any of, or all, the varieties recovered the loss in sucrose before the season closed.

October 13 an examination of the varieties upon a large scale commenced in Field A. The work was conducted the same as in Field B, and does not require any further comment.]

Variety "Elite," 100 beets were analyzed as "individuals," and 200 were tested in "tens." The mean results of the individual analyses showed 14.8 per cent of sugar.

The 200 beets analyzed in "tens" gave the results recorded in Table V.

The mean results of the analyses of the "Elite" variety, October 13, were: Mean sucrose in juice, 14.5 per cent; mean purity, 84.6 per cent.

October 14 the "Knauer" variety was tested. The mean result of the analysis of 100 individuals gave 14.8 per cent of sucrose in juice.

The results of the analyses of 200 beets in "tens" are recorded in Table VI.

The mean results of the two sets of analyses of the "Knauer" variety, October 14, were: Mean sucrose in juice, 14.8 per cent; mean purity, 88 per cent.

October 15 the "Lemaire" variety was examined.

One hundred "individuals" were analyzed separately, showing mean sucrose in juice, 14.2 per cent.

Two hundred beets were analyzed in sets of "tens," and the results are shown in Table VII.

The mean results of the two sets of analyses of the "Lemaire" variety, October 15, were: Mean sucrose in juice, 14.1 per cent; mean purity, 83.5 per cent.

October 16 the "Desprez" variety was analyzed.

One hundred beets analyzed "individually" gave the following mean result: Sucrose in juice, 14.8 per cent.

Two hundred beets analyzed in "tens" gave the results recorded in Table VIII.

The average results of the two sets of analyses of the Desprez variety October 16 were: Mean sucrose in juice, 14.4 per cent; mean purity, 84.6 per cent.

October 17 the Vilmorin variety was examined. One hundred beets analyzed separately gave the following mean result: Per cent sucrose in juice, 14.8.

Two hundred of the same variety analyzed in "tens" gave the results recorded in Table IX.

The average results of the two sets of analyses of the Vilmorin variety, October 17, were: Mean sucrose in juice, 14.6 per cent; mean purity, 84.9 per cent.

October 19 the Kleinwanzlebener variety was examined. One hundred "individuals" were analyzed and gave the following mean results: Per cent sucrose in the juice, 14.8 per cent.

Two hundred beets of the same variety, analyzed in "tens," gave the results recorded in Table X.

The average results of the Kleinwanzlebener variety October 19 were: Mean sucrose in juice, 14.5 per cent; mean purity, 82.8 per cent.

The analysis of each variety in both fields upon a very broad scale set forth the condition of the beets and the sugar value of the crop at the stated periods. The analysis, when put in comparison with the examinations made in September, show the action of the climatic conditions—the falling off of the sucrose in consequence of the rains, and the comparative capabilities of the varieties to recover their lost sucrose value.

The varieties in each field were gone over again and their condition determined after an interval of fourteen days. The examination recommenced in Field B. The "Elite" and "Knauer" varieties were not examined further, as they had attained full maturity and their maximum values were ascertained before the rains set in. The varieties "Lemaire," "Desprez," "Vilmorin," and "Kleinwanzlebener" remained in the ground in sufficient number to allow of a further thorough examination of their condition.

The purpose of the repeated analyses of the varieties at the given intervals was, in the first place, to observe the approach of each toward maturity and to determine the precise period when each variety had attained its maximum value, and, further, to note the specific effect of the great heat, followed by the rains, by observing the degree of the sucrose depreciation consequent on the "second growth" and to what extent the beets recovered their loss in sugar.

October 20 the "Lemaire" variety was reexamined. One hundred "individuals" gave the following mean results: Sucrose in juice, 14.1 per cent. Eighty beets, in "tens," gave the results recorded in Table XI.

The average results of the "Lemaire" variety, October 20, were: Mean sucrose in juice, 14.6 per cent; mean purity, 88.5 per cent.

October 21 the "Desprez" variety was retested. One hundred "individuals" gave the following mean result: Sucrose in juice, 14.1 per cent. (See Table XII.)

Three hundred and eighty beets in "tens" gave results recorded in Table XII *bis*.

The average results of the "Desprez" variety, October 21, were: Mean sucrose in juice, 14.1 per cent; mean purity, 87.7 per cent.

October 22 the Vilmorin variety was reexamined. Fifty "individuals" were analyzed and gave the following mean results: Sucrose in juice, 12.8 per cent.

Six hundred and sixty beets of the same variety, analyzed in "tens," gave the results recorded in Table XIII.

The average results of the Vilmorin variety, October 22, were: mean sucrose in juice, 13.4 per cent; mean purity, 85.8 per cent.

October 23 the Kleinwanzlebener variety was reexamined. Fifty "individuals" analyzed gave the following mean results: sucrose in juice, 14.1 per cent.

Six hundred and twenty beets, analyzed in "tens," gave results recorded in Table XIV.

The average results of the Klein-Wanzleben variety, October 23, were: mean sucrose in juice, 14.1 per cent; mean purity, 83.8 per cent.

On completing the reexamination of the varieties in Field B, the work of the following week was given to a complete investigation of the condition and results of the experiments on the small plats. It will be convenient, however, to bring in at this period the data obtained from the reexamination of the varieties in Field A, in order that the observations upon the large plats in Fields A and B may be brought to a conclusion.

The reëxamination of the varieties in Field A commenced October 31, and in the following order:

October 31 the "Elite" variety was analyzed and gave the following data:

Two hundred beets were analyzed in "tens," and the results are recorded in Table XV.

The average results of the analyses of the Elite variety, October 31, were: mean sucrose in juice, 14.2 per cent; mean purity, 83.9 per cent.

November 2 the "Knauer" variety was reëxamined. Two hundred beets, analyzed in "tens," gave the results recorded in Table XVI.

The average results of the analyses of the "Knauer" variety, November 2, were: mean sucrose in juice, 13.2 per cent; mean purity, 82.1 per cent.

November 2, the "Lemaire" variety was reëxamined; two hundred beets were analysed in "tens," and gave the results recorded in Table XVII.

The mean results of the analyses of the "Lemaire" variety, November 2, were: mean sucrose in juice, 12.6 per cent; mean purity, 80.0 per cent.

November 2, the "Desprez" variety was reëxamined. Two hundred beets were analysed in "tens," and gave the results recorded in Table XVIII.

The average results of the analyses of the "Desprez" variety, November 2, were: mean sucrose in juice, 12.6 per cent; mean purity, 80.9 per cent.

November 2, the Vilmorin variety was reëxamined. Two hundred beets, analysed in "tens," gave the results recorded in Table XIX.

The average results of the analyses of the "Vilmorin" variety, November 2, were: mean sucrose in juice, 13.1 per cent; mean purity, 83.6 per cent.

November 2, the "Kleinwanzlebener" variety was reëxamined. Two hundred beets were analysed in "tens," and gave the results recorded in Table XX.

The mean results of the analyses of the "Kleinwanzlebener" variety, November 2, were: mean sucrose in juice, 13.0 per cent; mean purity, 79.7 per cent.

The per cent of sucrose in the juice and the purity of the several varieties at the different periods are shown in the following résumé:

Field B.

Variety.	Date.	Sucrose in juice.	Purity.
		<i>Per cent.</i>	
Elite.....	Sept. 15	14.6	82.0
	Sept. 21	15.7	84.6
Knauer.....	Sept. 15	15.7	80.2
	Sept. 22	15.4	84.9
Lemaire.....	Sept. 15	13.2	77.0
	Sept. 26	13.8	81.2
	Oct. 20	14.6	88.5
Desprez.....	Sept. 15	13.8	81.3
	Oct. 6	13.5	.....
	Oct. 21	14.1	87.7
Vilmorin.....	Sept. 15	14.3	.....
	Oct. 8	13.8	.....
	Oct. 22	13.4	85.8
Kleinwanzlebener....	Sept. 15	14.7	.....
	Oct. 10	14.7	.....
	Oct. 23	14.1	83.8

Field A.

Variety.	Date.	Sucrose in juice.	Purity.
		<i>Per cent.</i>	
Elite.....	Sept. 12	12.6	75.9
	Oct. 13	14.5	84.6
	Oct. 31	14.2	83.9
Knauer.....	Sept. 12	11.5	75.7
	Oct. 14	14.8	88.0
	Nov. 2	13.2	82.1
Lemaire.....	Sept. 12	11.5	77.2
	Oct. 15	14.1	83.5
	Nov. 2	12.6	80.0
Desprez.....	Sept. 12	13.2	76.7
	Oct. 16	14.4	84.6
	Nov. 2	12.6	80.9
Vilmorin.....	Sept. 12	13.1	76.3
	Oct. 17	14.6	84.9
	Nov. 2	13.1	83.6
Kleinwanzlebener....	Sept. 12	13.6	77.7
	Oct. 19	14.5	82.8
	Nov. 2	13.0	79.7

The observations attaching to the varieties in Field B show that the "Lemaire" and "Desprez" varieties made improvement in October after the bad effects of the rains had abated. The "Vilmorin" and "Kleinwanzlebener" varieties, which were nearer maturity than the two former varieties at the time that the rains fell, never recovered their lost ground, but continued to fall off in sucrose. The weather, however, was very unfavorable to a recovery from the effects of the "second growth" consequent on the rains. Although there was very little rain after the first week in October, the weather was ungenial. The nights were frosty and the days very changeable and raw, and not in any degree favorable to a gradual maturity of the beets, if considered in comparison with the general tone of the fall weather in the beet districts of Europe.

In Field A, no analytical data was obtained immediately before nor immediately after the rains, but the table indicates clearly the period in October when the varieties had reached their maximum value, and that later there was a notable falling off both in the sugar content and the purity of the juices, or, in other words, the beets were at the best for sugar-making purposes in the first half of October, and that by the end of the month they had fallen off in value for the factor not less than 15 per cent considering the decreased purity of the juices in connection with the actual loss of sucrose in the beets.

If an analysis of the respective behaviors of the varieties be attempted any very conclusive data can hardly be established; nevertheless it is observed in Field B that the "Elite" and "Knauer" varieties came first to maturity. Again, in respect of the property to resist and recover from the unfavorable climatic conditions, the "Lemaire" and "Desprez" varieties appeared to excel the "Vilmorin" and "Kleinwanzlebener" varieties; but, as it has already been said, that difference in favor of the two former varieties might be wholly owing to their being farther from maturity at the time that the rains fell. In Field A, the behavior of the varieties was so very uniform that there is not room for safe comment in favor of any one.

More exact conclusions may be established of the actual values of the varieties by comparing the weight per acre with the sugar contained in the beets of each variety. In doing that the highest average sucrose reading will be used with the weight per acre in order that the maximum value expressed in the yield of sugar per acre may be given. The following tables set forth the comparative values of the varieties:

Field B.

Variety.	Weight per acre.	Sucrose in beets.	Sugar per acre.
	<i>Tons.</i>	<i>Per cent.</i>	<i>Pounds.</i>
Elite	20.56	14.9	6,126
Knauer	21.28	14.9	6,341
Lemaire	23.49	13.8	6,473
Desprez	26.40	13.4	7,081
Vilmorin	25.80	13.6	6,959
Kleinwanzlebener	24.60	13.9	6,838

Field A.

Variety.	Weight per acre.	Sucrose in beets.	Sugar per acre.
	<i>Tons.</i>	<i>Per cent.</i>	<i>Pounds.</i>
Elite	18.1	13.8	5,001
Knauer	17.7	14.0	4,945
Lemaire	18.4	13.4	4,924
Desprez	21.3	13.7	5,837
Vilmorin	21.1	13.9	5,855
Kleinwanzlebener	22.5	13.8	6,204

In order to come at the volume and value of production of the respective varieties this season, and to obtain an indication of the comparative value and adaptability of the varieties to the soil and climate in which they have been grown, the mean of each variety in field A and field B will be given, expressed in the weight of beets per acre, the sugar per acre, and the purity of the juices, from which collective data a precise estimate may be formed of the value of each variety, both to the grower of the beets and the manufacturer of the sugar.

Mean of field A and field B.

Variety.	Weight per acre.	Sugar per acre.	Purity of juices.
	<i>Tons.</i>	<i>Pounds.</i>	
Elite	19.33	5,564	84.6
Knauer	19.49	5,643	86.4
Lemaire	20.94	5,698	86.0
Desprez	23.85	6,453	86.2
Vilmorin	23.45	6,407	85.4
Kleinwanzlebener	23.55	6,521	83.3

The analysis of the varieties does not require further comment. The almost identical values of the "Kleinwanzlebener," "Desprez," and "Vilmorin" varieties are very notable. The other varieties form a second class in respect of the actual money value per acre.

It may be of interest to add a comparison of the results obtained by the Department beet station with those of a station in Europe, where the work is conducted with the same care and accuracy. The Chapelle agricultural station, France, affords the data for such a comparison published in the official bulletins of this year. The data of the Chapelle station represent the mean condition and results of several experimental plats at the several periods stated, and the statement of the Department station gives the mean condition of all the varieties and plats at almost corresponding periods in the season at Schuyler.

Stations.	Date.	Weight of beets per acre.	Sugar per acre.
		<i>Tons.</i>	<i>Pounds.</i>
Chapelle (France)	Sept. 9	11.35	3,014
	Oct. 7	14.86	4,182
	Nov. 18	16.30	4,919
Schuyler (Nebr.)	Sept. 15	21.77	5,790
	Oct. 15	21.77	6,060
	Nov. 2	21.77	5,393

The exact weight of each plat on the Schuyler station was not obtained upon all the dates given, but certain plats were weighed September 12 and 15 and October 26, and the weight of beets per acre was found to be constant. The sugar content on September 15 indicated that the maximum growth had been attained, although there was room for improvement in the state of maturity of the juices.

A comparison of the data given of the two stations suggests the dissimilar climatic conditions attending the maturing season in the respective countries. In France the beets mature slowly and late into the fall. In Nebraska the season is early, prompt, and sooner over.

SMALL PLATS.

The results of the experiments conducted upon the small plats will now be examined.

It was explained in the early part of the report that those experiments consisted of three series, having the following purposes:

(1) The determination of the distances that the beets should be planted apart from each other in order to obtain the maximum production, expressed in weight of beets and sugar per acre.

(2) The observing of the effects (if any) of varying quantities of phosphate fertilizers upon the yield of beets and sucrose.

(3) To indicate the time when it may be most advisable to plant the beet seed in the conditions which obtain in the district where the station is located.

It must be previously observed that the analytical work upon an exhaustive scale was not commenced upon those small plats until a week after the beets were at their best. As a consequence the total value of the results of the plats as indicated by the content of sucrose present in the juices will appear low, and it is certain that the sucrose in the juices of all the plats, excepting Nos. 14 and 15, was lower by 1 per cent at the time of analyzing than it was a week before. The plats Nos. 14 and 15 were very late in maturing, not having been planted until June.

FIRST SERIES.

The weight of beets per acre of each plat will first be given. The beets on each plat were planted exactly 6 inches apart in the rows. The distance between the rows was different upon each plat, thus showing a varying scale of the number of beets to the acre.

Plat.	Distance between rows.	Number of beets per acre.	Weight per square rod.	Weight per acre.
	<i>Inches.</i>		<i>Pounds.</i>	<i>Tons.</i>
No. 1	12	87, 137	300	24
2	14	74, 674	252	20. 2
3	16	65, 340	219	17. 5
4	18	58, 080	198	15. 8
5	20	52, 272	190	15. 4
6	22	47, 520	175. 5	14

The sugar content of the juices of the plats is given in the following tables:

Plat No. 1.—Sixty beets were analyzed individually and gave the following mean results: Per cent sucrose in juice, 13.8.

Sixty beets analyzed in "tens" gave the results recorded in Table XXI.

The average results of the analyses No. 1 Plat were: Mean sucrose in juice, 13.7 per cent; mean purity, 80.8 per cent.

Plat No. 2.—Sixty individuals analyzed the following mean result: Sucrose in juice, 13.1 per cent.

Sixty beets analyzed in "tens" gave results recorded in Table XXII.

The average results of the analyses of No. 2 Plat: Mean sucrose in juice, 13.1 per cent; mean purity, 82.7 per cent.

Plat No. 3.—Sixty individuals analysed gave the following mean results: Sucrose in juice, 14 per cent.

Sixty beets analyzed in "tens" gave results recorded in Table XXIII.

The mean results of the analyses of No. 3 Plat were: Mean sucrose in juice, 13.5 per cent; mean purity 80.9 per cent.

Plat No 4.—Sixty individuals analyzed separately gave the following mean result: Sucrose in juice, 13 per cent.

Sixty beets analyzed in "tens" gave the results recorded in Table XXIV.

The mean results of the analyses of No. 4 Plat were: Mean sucrose in juice, 12.9 per cent; mean purity, 80 per cent.

Plat No. 5.—Sixty individuals analyzed separately gave the following mean result: Sucrose in juice, 13.5 per cent.

Sixty beets analyzed in "tens" gave the results recorded in Table XXV.

The average results of the analyses of No. 5 Plat were: Mean sucrose in juice, 13.0 per cent; mean purity, 77.7 per cent.

Plat No. 6.—Sixty "individuals" analyzed separately gave the following mean result: Sucrose in juice, 12.8 per cent.

Sixty beets analysed in "tens" gave the results recorded in Table XXVI.

The average results of the analyses of No. 6 Plat were: Mean sucrose in juice, 12.9 per cent; mean purity, 80.5 per cent.

The value per acre of each of the plats, expressed in weight of beets and sugar per acre, was as follows:

Plat.	Distance between the rows.	Weight of beets per acre.	Sugar per acre.
	<i>Inches.</i>	<i>Tons.</i>	<i>Pounds.</i>
No. 1.	12	24.0	6,240
2.	14	20.2	5,009
3.	16	17.5	4,480
4.	18	15.8	3,855
5.	20	15.4	3,788
6.	22	14.0	3,416

It must be said, by way of comment upon the comparatively low weights per acre of the beets, that the small plats suffered the most excessive effects of the heavy rains of June and July because of the ground lying lower than the large plats near by. Moreover, the rows ran from east to west instead of from north to south (the form of the plats made the other direction impracticable), and that was specially disadvantageous in the wet season.

It was observed that the individual beets were very little larger on the plats where the rows were 22 inches apart than on the plats where the rows were only 12 inches distant from each other. The beets in the rows, however, were planted only 6 inches apart on all the plats, and that circumstance controlled the comparative uniformity of the size of the beets throughout, the distance between the plants in the row being a more important factor than the distance between the rows in deciding the size of the beet.

SECOND SERIES.

The five following plats were devoted to observing the effect of phosphorous fertilizers upon the production of weight of beets and sugar per acre.

The fertilizer experimented with was a slag phosphate. The application of the fertilizer was at the time of planting the seed. The results may serve to indicate that those soils do not require any aid from artificial fertilizing agents.

The results will be given in brief in the following table:

Plats.	Fertilizer per acre.	Weight of beets per acre.	Sugar per acre.
	<i>Pounds.</i>	<i>Tons.</i>	<i>Pounds.</i>
No. 7.....	160	16.3	4,192
8.....	240	16.7	4,141
9.....	320	15.6	3,900
10.....	480	15.4	3,942
11.....	640	14.5	3,699
0.....	(*)	15.8	3,855

* Nonfertilized plat.

THIRD SERIES.

The following four plats were used for the purpose of observing the results obtained from beets planted at different periods.

The plats Nos. 14 and 15 did not suffer so much from the heavy rains; otherwise the conditions were equal. The results are given in brief in the following table:

Plat.	Date of planting.	Weight of beet per acre.	Sugar per acre.
		<i>Tons.</i>	<i>Pounds.</i>
No. 12.....	May 12	14.1	3,750
13.....	May 19	13.2	3,616
14.....	May 26	14.9	3,993
15.....	June 2	12.5	3,450

During the analytical season experiments were conducted for the purpose of ascertaining—

(1) The loss of weight in the beets from evaporation when exposed for varying lengths of time.

(2) The action upon the sucrose contained in the beet when the latter is removed from its connection with the soil.

It has been claimed that when beets are taken up out of the soil and stored a further increase of sucrose takes place in the organism, and more lately it has been stated that if the beets are disturbed by an implement sufficiently to break the root connection with the ground, the beets being left in the soil, an increase of sucrose takes place. There does not appear to be anything in the organism of the beet to induce such an expectation.

The evaporation experiments were made in two series:

(1) With beets fastened up in a bag and kept from the sun and wind.

(2) With beets under normal exposure to air and sun.

Table of first series.

Date.	Maxi- mum air temper- ature.	(1) Weight of beet.	Loss.	(2) Weight of beet.	Loss.	(3) Weight of beet.	Loss.	(4) Weight of beet.	Loss.
		<i>Grams.</i>	<i>Per cent.</i>	<i>Grams.</i>	<i>Per cent.</i>	<i>Grams.</i>	<i>Per cent.</i>	<i>Grams.</i>	<i>Per cent.</i>
Oct. 12	53	1,283	.....	648	.....	753	.....	426	.....
Oct. 13	63	1,242	3.2	620	4.4	725	3.8	404	5.2
Oct. 14	52	1,188	7.3	592	8.8	703	6.7	381	10.6
Oct. 15	52	1,166	9.2	579	10.7	691	8.3	370	13.2
Oct. 16	76	1,136	11.5	563	13.2	676	10.3	358	16
Oct. 17	65	1,111	13.4	550	15.2	660	12.4	350	17.9
Oct. 18	59	1,085	15.5	538	17	650	13.7	329	22.8
Oct. 19	67.5	1,055	17.8	518	20.1	631	16.2	315	26.1

Table of second series.

Date.	Maxi- mum air temper- ature.	(1) Weight of beet.	Loss.	(2) Weight of beet.	Loss.	(3) Weight of beet.	Loss.	(4) Weight of beet.	Loss.
	°	<i>Grams.</i>	<i>Per cent.</i>	<i>Grams.</i>	<i>Per cent.</i>	<i>Grams.</i>	<i>Per cent.</i>	<i>Grams.</i>	<i>Per cent.</i>
Oct. 12	53	724	-----	661	-----	503	-----	580	-----
Oct. 13	63	661	8.8	592	10.5	457	9.2	537	7.5
Oct. 14	52	620	14.4	542	18	418	16.9	501	13.7
Oct. 15	52	592	18.3	516	22	401	20.3	473	18.5
Oct. 16	76	570	21.3	493	25.5	375	25.5	456	21.4
Oct. 17	65	548	24.4	468	29.2	366	27.3	435	25
Oct. 18	59	526	27.4	447	32.4	351	30.3	416	28.3
Oct. 19	67.5	505	30.3	426	35.6	335	23.4	396	31.8

If the mean loss of weight be taken of the individual beets each day, as shown by the two tables, a ratio of evaporation may be determined, and a standard of correction established approximately exact, to be applied in the analysis of beets which have been some time out of the ground.

First series, ratio of evaporation.		Second series, ratio of evaporation.	
	<i>Per cent.</i>		<i>Per cent.</i>
Loss of weight for one day.....	4.2	Loss of weight for one day.....	9
two days.....	8.5	two days.....	15.7
three days.....	10.4	three days.....	19.8
four days.....	12.8	four days.....	23.4
five days.....	14.7	five days.....	26.5
six days.....	17.3	six days.....	29.6
seven days.....	20	seven days.....	32.5

In addition to the observations conducted with individual beets, an experiment was made with a square rod of beets in the middle of a large plat. The beets were got up and the tops removed exactly as though prepared for the factory and then left lying on the ground with a normal exposure to the air and sun.

Third series.

Weight of 1 square rod of beets.		Ratio of evaporation.	
	<i>Pounds.</i>		<i>Per cent.</i>
Original weight.....	267.5	Loss of weight for—	
Second weight.....	226	Two days.....	15.6
Third weight.....	209	Four days.....	21.9
Fourth weight.....	192	Six days.....	28.3

Upon the third day of exposure rain fell, consequently the evaporation was somewhat retarded.

It will be understood that the "loss of weight" for the given periods means the loss in per cent of the weight of the beet and not the per cent of water evaporated of the original water contained in the beet. The per cent of water lost would be greater than the numbers given.

As the "loss of weight" implies the loss of weight of the beet, the per cent of loss means an equal per cent gain in the reading of the sucrose, and the correction should be as follows:

A beet which reads 15 per cent of sucrose, but which has lost 20 per cent of its original weight, should be read: Sucrose in juice, 15 per cent less; loss of weight in beet, 20 per cent; actual sucrose in juice, 12 per cent.

In proceeding to a consideration of the second proposition, viz, "the action upon the sucrose present in the beet consequent upon breaking the connection of the latter with the soil," the data obtained in the evaporation experiments are of the first value. It may, in the first place, be indicated that any apparent increase of sucrose in a beet which has had its taproot broken, or which has been in any way detached or

loosened in its connection with the soil, is due wholly to a loss of weight in the beet by evaporation, and a proportional relative increase in the per cent of solids in the same. If a beet is disturbed sufficiently to break the taproot and the hundreds of small fibrous rootlets, even if it is not lifted out of the soil, the leaves rapidly wilt and in time the flesh of the beet becomes soft. The simple explanation is that the evaporation of water from the surface of the beet, which proceeds without intermission during the whole period of growth, continues after the breaking of the connection of the beet with the soil, but the connection with the soil being broken, the beet is no longer able to take up fresh water from the earth to replace the amount lost by evaporation. Consequently the beet loses weight, and an apparent increase of sucrose takes place, the latter being solely due to the decrease of water in the organism and a corresponding increase of solid matters.

There is another phase to the question under consideration. Does a loss of sucrose, through decomposition, take place in the beet after it is taken out of the soil and stored either under the surface of the ground in pits or silos or in any other way? Actual experiment could be the only means of deriving an answer to the proposition.

At the time that the beets of each of the varieties were gotten up for analysis and for the selection of mother beets for propagation use, a certain portion of the latter class were placed in small pits in the ground about 9 inches under the surface and well protected with moist earth. A part of the beets was placed in the pits with the tops on, and the other part the tops were cut off 1 inch from the neck before they were stored. The beets were kept in the ground in those pits from October 15-19 to November 6, when they were taken out and put in the permanent silos for the winter. At the same time a further number of beets was left in the ground till a later date and then gotten up and analyzed fresh in order to compare with the beets placed in the pits. The results were as follows:

Field B.

Variety.	Fresh beets.				Stored beets.			
	Date.	Sucrose in juice.	Date.	Sucrose in juice.	Date.	Sucrose in juice.	Date.	Sucrose in juice.
		<i>Per cent.</i>		<i>Per cent.</i>		<i>Per cent.</i>		<i>Per cent.</i>
Desprez.....	Oct. 6	13.5	Oct. 21	14.1	Oct. 6	13.5	Nov. 6	12.3
Vilmorin	Oct. 8	13.8	Oct. 22	13.4	Oct. 8	13.8	Nov. 6	12.2
Kleinwanzlebener .	Oct. 10	14.7	Oct. 23	14.1	Oct. 10	14.7	Nov. 6	13.4

Field A.

Variety.	Fresh beets.		Stored beets.	
	Date.	Sucrose in juice.	Date.	Sucrose in juice.
		<i>Per cent.</i>		<i>Per cent.</i>
Elite.....	Oct. 13	14.5	Nov. 6	12.7
Knauer	Oct. 14	14.8	Nov. 6	11.6
Lemoire	Oct. 15	14.1	Nov. 6	13
Desprez	Oct. 17	14.4	Nov. 7	12.5
Vilmorin	Oct. 18	14.6	Nov. 7	12.9
Kleinwanzlebener	Oct. 19	14.5	Nov. 7	12.5

In comparing the results of the "fresh" and "stored" beets it must be remembered that the latter had lost some water by evaporation, so that the sucrose should have been higher in the juices of the stored beets than in the juices of the fresh beets. It is thus seen that the actual decrease and loss of sugar in the stored beets was greater than is indicated in the table given.

An experiment was made with individual beets, also with the purpose of observing if there were a decrease in sucrose contained in the beets after removal of the latter from the soil. The experiment was made as follows:

Twenty beets were taken fresh from the soil, the tops removed, washed, and dried. Each beet was cut into equal halves and the halves marked No. 1 and No. 2. No. 1

of each of the twenty beets was immediately weighed, the juice expressed and the sucrose determined in the latter. The No. 2 halves of the beets were also weighed immediately and afterwards laid upon a board with the cut surfaces upward and remained thus for five days, when they were reweighed, in order to ascertain the loss of weight by evaporation. After reweighing, the No. 2 halves were immediately analyzed and the actual sucrose contained in the juice of each half determined.

Having determined the sucrose contained in the No. 1 half of each of the beets, and having further determined the loss of weight in each of the No. 2 halves, it was possible to observe whether a decrease of sucrose had taken place or not. The per cent increase of sucrose in the juices of the No. 2 halves should be exactly equal to the per cent decrease in the weight of the beets, if no loss of sucrose had taken place.

Instead of the data belonging to each beet being given, the mean data will be given of the No. 1 and No. 2 series.

Beets.	Mean of first weights.	Mean of second weights.	Mean of sucrose in juices.	Loss of weight of beets.	Increase of sucrose in juice.	Loss of sucrose.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
No. 1 halves	350	-----	14.5	-----	-----	-----
No. 2 halves	345	248	18.4	28.2	19.2	9

If the juices of the No. 2 halves had gone up in sucrose in the exact proportion per cent that the beets had decreased in weight, those juices would have contained 20.2 per cent instead of 18.4 per cent which was actually found. The difference between 20.2 per cent and 18.4 per cent gives the loss of 9 per cent of the original content of sucrose in the beets.

The data obtained from the experiments with large numbers of beets of six varieties, and the observations made with the halves of the individual beets, indicate that a loss of sucrose takes place when the beets are removed from their normal connection with the soil.

In reviewing generally the characteristics of the season, and the result of the experimental work of the station, we have to observe the following:

The late date upon which it was decided to establish the station at its present location did not permit of the best advised plan of cultivation, and delayed the conducting of farm operations till April, which should have been performed in the preceding fall.

The cultural season was marked by the widest extremes of climatic conditions. The planting period was a continuance of drought, lasting from April 20 to June 2. At the end of the dry period a succession of weeks of rains followed, which were abnormal when compared with the usual precipitation for the months of June and July. The abnormal conditions accompanied the development of the season to its end. The steady and continuous heat common to the months of July and August was, in the most part, postponed till the middle of September; and the extreme heat of the latter month was followed again by rains which amounted to more than twice the normal precipitation for that period. The results of the work of this season have been achieved under the influence of climatic conditions unusually unfavorable.

Experiments conducted comparatively with the soils of Maryland, Indiana, and Nebraska indicated the peculiar adaptability of the soil to the climate in the latter State, which fact may be found to obtain equally for the other States.

The general results of the analytical season are found to be satisfactory both in respect of the weight of beets and yield of sugar per acre. In such respect the results of the Schuyler Station compare satisfactorily with the work of corresponding stations in Europe.

The observations made upon the results of the six varieties used in the experimental work of the station, have resolved those varieties into two classes, in respect

of the actual money value per acre of their products, viz, the first class including the "Kleinwanzlebener," "Desprez," and "Vilmorin" varieties, whose values are uniform. The "Lemaire," "Elite," and Knauer" have also an approximately equal value, which, however, is much below that of the three former varieties.

The experiments conducted with the view of observing the results of early and late planting indicated that early planting may be expected to give the highest money value yield per acre. That conclusion, indicated by the experiments upon the small plats, is supported by the actual results obtained in Field B in comparison with Field A, the beets in the former field having been planted several days earlier than the other, and the rate of development continued fourteen days in advance of the beets in the latter field.

The fertilizer experiments indicate that the soil of the station farm contains all the constituents of plant food in abundance, and that artificial aid can not be given to the growing plant with any apparent advantage.

In respect of the distances that the beets should be placed from each other, or the number of plants given to an acre, the experiments on the No. 1 series of the small plats have shown conclusively that the money value of the crop was greatest where the greatest number of beets were placed upon the acre. The economic consideration, viz, the greater cost of raising an acre of beets planted closely together is very secondary in comparison with the greater money value of the product. Instead of the distances at which beets should be planted between the rows being regulated by the consideration of implements which have been invented for the cheap cultivation of the crop, the character of the implements should be adapted to the highest value and advantage of the crop.

The means of analyses indicating the condition of the beets at the periods when the tests were made show that the crop generally, and particularly in Field B, where the beets were planted early, had reached a high condition, in respect of the weight of the beets and the sugar content of the juices, on September 15. Further, that certain of the varieties had reached a maximum value by September 25, and that all of the varieties were at their best by October 15, and after that date the content of sucrose began to fall away. Those observations indicate the time when, in a normal season, the harvesting and handling of the beets by the factories should commence in that part of Nebraska. The past season has been an abnormal and late one, and it is apparent that with a moderately early planting season (April 20 to May 1), and proper cultivation, a crop should be ready for the factory commencing September 1. The period of maturity depends upon the beet as well as the time of planting and cultivation, and in such respect it is indicated that if the three varieties are used, which have been found to be the best this year, it would be advisable to plant them in the following order: "Vilmorin," "Kleinwanzlebener," "Desprez," and they will mature most advantageously in that order for the factory. In view of the early date in the season that the factories may have to suspend operations on account of frost, an "early season" is of the greatest importance. Commencing September 1, a three months' factory season is almost assured, and that would enable a factory with a capacity of 300 tons per day to work up about 30,000 tons of beets by December 1, or the product of 3,000 acres at 10 tons per acre.

The experiments made in order to determine the loss of weight by evaporation, and to ascertain the effect of evaporation with the removal of the beets from the earth upon the sucrose contained in the beet have indicated that no gain occurs in the sucrose content of the beet, but that an actual loss of sugar takesplace if any length of time is allowed to transpire between the raising of the beets from the soil and the handling of them in the factory. It thus appears of advantage to the grower and the manufacturer that the beets should not only be harvested at the period of their maximum sugar value, but that they should be handled by the factory as nearly as possible as they come fresh from the field.

TABLE I.—*Analyses of one hundred Kleinwanzlebener Elite sugar beets.*

[Date: September 21.]

No.	Average weight beets.	Sucrose in juice.	No.	Average weight beets.	Sucrose in juice.	No.	Average weight beets.	Sucrose in juice.	No.	Average weight beets.	Sucrose in juice.
	<i>Grams.</i>	<i>Per ct.</i>		<i>Grams.</i>	<i>Per ct.</i>		<i>Grams.</i>	<i>Per ct.</i>		<i>Grams.</i>	<i>Per ct.</i>
1	231	16.8	26	650	15.9	51	602	15.8	76	401	16.8
2	380	12.2	27	223	16.0	52	484	15.1	77	272	15.8
3	766	11.8	28	288	15.0	53	412	14.8	78	343	15.5
4	738	14.0	29	482	13.7	54	537	14.0	79	342	18.9
5	736	13.2	30	96	16.4	55	814	10.0	80	709	12.7
6	742	12.6	31	409	16.4	56	418	15.6	81	346	14.0
7	341	13.5	32	565	14.3	57	343	18.4	82	350	16.6
8	411	13.5	33	625	18.0	58	377	17.6	83	858	14.2
9	255	14.6	34	770	13.7	59	679	13.9	84	625	15.7
10	564	12.7	35	367	15.8	60	519	15.5	85	250	17.0
11	292	15.2	36	725	13.9	61	931	13.5	86	228	17.8
12	149	13.0	37	189	13.5	62	470	16.7	87	328	15.8
13	145	15.0	38	502	13.8	63	370	16.7	88	432	15.4
14	412	13.6	39	538	14.5	64	439	16.5	89	265	17.6
15	254	14.6	40	636	16.4	65	243	17.6	90	359	16.0
16	224	16.0	41	325	18.1	66	239	17.0	91	296	14.0
17	395	13.4	42	489	16.9	67	278	16.2	92	220	15.2
18	140	17.0	43	473	16.7	68	195	15.5	93	240	15.2
19	212	13.0	44	281	14.5	69	279	18.2	94	510	17.2
20	1,124	12.2	45	241	17.3	70	306	15.9	95	497	15.3
21	171	16.8	46	294	17.7	71	431	14.4	96	522	13.8
22	229	16.0	47	354	16.8	72	565	15.0	97	360	17.8
23	598	14.0	48	379	14.1	73	349	15.7	98	165	18.7
24	227	17.2	49	167	15.8	74	360	17.2	99	120	18.6
25	219	17.8	50	390	13.6	75	177	16.7	100	119	20.4

TABLE II.—*Variety Kleinwanzlebener Elite, analyzed in eighty groups of ten beets each.*

[Date: September 22.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	472	17.4	13.5	78.1	42	192	19.3	17.0	88.1
2	398	18.4	14.9	81.0	43	299	18.3	15.4	84.2
3	579	17.8	14.1	79.2	44	357	20.2	16.9	83.7
4	422	18.4	15.1	82.1	45	261	17.8	14.4	80.9
5	378	18.3	15.3	81.4	46	346	18.7	15.9	85.0
6	454	18.4	14.5	78.8	47	331	18.8	15.8	84.0
7	410	18.9	15.1	80.0	48	331	19.8	16.9	85.4
8	396	18.4	14.9	81.0	49	348	18.7	15.4	82.4
9	404	18.4	14.4	78.3	50	303	18.7	15.4	82.4
10	363	17.9	16.3	91.0	51	303	18.7	15.5	82.9
11	394	19.2	15.5	80.7	52	341	19.3	16.9	87.6
12	430	19.0	15.6	82.1	53	363	18.4	15.5	84.2
13	387	19.0	15.3	80.5	54	346	18.4	15.1	82.0
14	344	19.3	16.1	83.4	55	274	18.7	15.8	84.5
15	406	18.6	15.3	82.3	56	335	18.6	15.7	84.4
16	359	19.1	15.6	81.7	57	342	18.4	15.6	84.8
17	337	19.6	16.6	84.7	58	341	19.2	16.8	87.5
18	291	19.7	16.7	84.8	59	317	18.2	15.2	83.5
19	307	18.9	14.6	78.5	60	279	19.3	16.3	84.5
20	433	17.9	14.4	80.4	61	299	19.2	16.2	84.4
21	421	18.7	15.8	84.4	62	241	19.1	16.1	84.3
22	354	18.3	15.3	83.6	63	327	18.7	15.3	81.8
23	421	19.5	16.1	82.6	64	286	18.5	15.1	81.6
24	331	19.1	15.3	80.0	65	271	17.8	15.3	87.1
25	467	18.4	16.0	87.0	66	217	19.3	16.6	86.0
26	298	19.3	16.1	83.4	67	238	18.5	16.7	90.3
27	330	19.6	16.5	84.2	68	262	19.6	17.5	89.2
28	292	18.3	15.1	82.5	69	332	18.6	15.8	84.9
29	252	18.7	15.7	84.0	70	296	18.8	15.5	82.4
30	328	18.6	15.6	83.9	71	364	18.7	15.4	82.4
31	319	18.8	15.8	84.0	72	341	18.6	15.0	80.6
32	363	19.0	16.0	84.2	73	281	19.2	16.1	83.9
33	318	18.6	15.4	82.8	74	311	18.2	15.0	82.4
34	271	18.7	15.9	85.0	75	285	19.5	16.8	86.2
35	307	19.1	16.7	87.4	76	358	19.3	16.1	83.4
36	337	18.2	15.1	83.0	77	394	17.9	14.6	81.6
37	246	19.0	16.0	84.2	78	382	19.3	16.3	84.5
38	231	19.6	17.4	88.8	79	329	18.1	15.0	82.9
39	325	18.5	15.6	84.3	80	234	18.9	16.3	86.2
40	311	19.8	16.7	84.3					
41	238	19.0	16.9	89.0	Mean	.....	.....	15.7	84.6

TABLE III.—Showing analysis of sixty-two sets, of ten beets each, of the *Ferdinand Knauer* variety.

[Date: September 24.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	471	18.7	15.5	82.9	33	262	19.0	16.0	84.2
2	372	18.6	15.1	81.2	34	272	18.9	16.4	86.8
3	360	18.0	15.0	83.3	35	379	18.6	15.8	84.9
4	451	18.8	15.2	80.8	36	264	18.2	14.8	81.3
5	469	17.2	14.1	82.0	37	256	19.1	16.1	84.3
6	372	18.0	15.0	83.3	38	323	18.7	15.8	84.5
7	503	16.5	13.0	78.8	39	308	18.5	15.3	82.7
8	353	18.4	15.6	84.8	40	325	18.0	15.5	86.4
9	326	18.2	15.3	84.1	41	268	18.3	14.9	81.0
10	505	17.2	13.9	80.8	42	266	18.8	15.7	83.5
11	371	18.1	15.6	86.2	43	405	15.8	14.4	91.1
12	503	17.9	14.9	83.2	44	393	17.9	14.5	81.0
13	400	17.3	14.5	83.8	45	314	18.0	15.4	85.6
14	412	17.8	15.0	84.3	46	255	18.1	15.5	85.7
15	393	18.5	15.8	85.4	47	360	18.7	15.8	84.5
16	419	17.9	15.0	83.8	48	347	18.2	15.8	81.8
17	499	17.8	15.0	84.3	49	314	17.6	15.8	89.8
18	328	17.4	16.0	92.0	50	333	18.0	15.3	85.0
19	284	17.8	15.0	84.3	51	332	17.4	14.5	83.3
20	392	18.9	15.8	83.6	52	489	16.4	12.3	75.0
21	313	18.7	15.4	82.4	53	319	17.5	15.0	85.7
22	164	18.4	15.8	85.9	54	282	16.9	14.3	84.6
23	287	18.1	14.8	81.8	55	333	18.5	14.7	79.5
24	206	19.7	16.2	82.2	56	317	17.3	13.8	79.8
25	275	18.1	14.9	82.3	57	374	17.8	14.3	80.3
26	250	17.4	14.3	82.2	58	364	17.7	14.0	79.1
27	251	18.2	14.4	79.1	59	362	18.4	15.6	84.8
28	281	18.6	15.5	83.3	60	359	18.6	15.2	81.7
29	256	18.6	15.5	83.3	61	374	17.4	14.0	80.5
30	272	17.5	14.4	82.3	62	551	17.5	13.8	78.9
31	186	19.2	17.3	90.1					
32	279	18.5	15.5	83.8	Mean	-----	-----	15.1	84.9

TABLE IV.—Showing analyses of beets in sixty sets, of ten beets each, of the *Lemaire* variety.

[Date: September 26.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	538	17.2	13.3	77.3	32	634	17.1	13.3	77.8
2	415	17.1	13.7	80.1	33	320	17.5	14.2	81.1
3	343	17.2	14.1	82.0	34	325	17.5	14.0	80.0
4	657	17.1	13.3	77.8	35	507	17.1	13.9	81.3
5	492	16.4	13.0	79.3	36	535	16.9	14.2	84.0
6	422	17.7	14.5	81.9	37	290	17.4	14.4	82.7
7	542	16.8	13.5	80.4	38	488	17.5	14.2	81.1
8	461	16.9	14.2	84.6	39	514	16.9	14.0	82.8
9	465	16.5	13.4	81.2	40	286	17.7	14.9	84.2
10	504	17.7	14.1	79.7	41	371	17.5	14.0	80.0
11	351	18.4	14.7	80.0	42	374	17.4	14.4	82.7
12	417	17.9	14.5	81.0	43	370	17.8	14.5	81.5
13	485	17.0	13.7	80.6	44	331	18.4	15.3	83.2
14	438	17.4	13.9	79.9	45	287	17.9	15.1	84.4
15	486	16.4	13.4	81.7	46	278	15.5	12.0	77.4
16	527	17.5	14.1	80.6	47	377	17.4	14.0	80.5
17	338	16.1	14.2	88.2	48	388	16.5	13.5	81.8
18	499	17.5	14.3	81.7	49	375	17.7	14.0	79.1
19	493	16.7	13.4	80.2	50	387	17.3	14.6	84.4
20	422	17.6	15.1	85.8	51	338	17.8	14.3	80.3
21	314	16.3	13.3	81.6	52	359	17.6	14.7	83.5
22	327	17.3	14.3	82.6	53	371	17.4	13.9	79.9
23	383	17.8	14.7	82.6	54	365	15.9	14.7	92.5
24	540	16.7	13.0	77.8	55	484	17.1	14.4	84.2
25	517	17.8	14.0	78.7	56	398	17.0	13.4	78.8
26	517	17.6	14.2	80.7	57	384	16.9	13.1	77.3
27	354	16.7	13.7	82.0	58	365	15.9	13.3	83.6
28	313	17.3	13.7	79.2	59	372	16.9	13.3	78.7
29	452	17.2	14.1	82.0	60	244	16.6	13.9	83.7
30	559	17.0	13.8	81.2					
31	361	16.7	13.1	78.4	Mean	-----	-----	13.8	81.2

TABLE V.—*Showing analyses of twenty sets of ten beets each of the Kleinwanzlebener Elite variety.*

[Date: October 13.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
		<i>Grams.</i>	<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	289	16.9	14.7	87.0	12	349	16.8	14.3	85.1
2	278	17.1	14.6	85.4	13	334	16.1	13.8	85.7
3	287	16.6	13.2	79.5	14	314	16.5	14.0	84.8
4	295	17.0	12.6	74.1	15	259	15.7	14.3	91.1
5	344	17.0	13.9	81.8	16	310	16.2	13.4	82.7
6	355	16.4	14.5	88.4	17	203	16.3	13.0	79.8
7	278	16.2	13.9	85.8	18	143	17.2	14.9	86.6
8	299	17.0	14.0	82.4	19	267	16.9	14.5	85.8
9	309	16.6	13.7	82.5	20	162	16.8	15.3	91.1
10	372	16.3	14.6	89.6					
11	364	16.5	13.8	83.6	Mean.	.....	.....	14.1	84.6

TABLE VI.—*Showing analyses of twenty sets of ten beets each of the Ferdinand Knauer variety.*

[Date: October 14.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	323	16.4	12.4	75.6	12	231	17.0	15.4	90.6
2	382	16.3	12.8	78.5	13	217	17.5	15.1	86.3
3	323	16.6	14.0	84.3	14	221	16.8	15.5	92.3
4	366	16.3	14.3	87.7	15	229	15.8	14.5	91.8
5	355	16.7	15.1	90.4	16	245	16.8	14.2	84.5
6	330	17.2	14.7	85.5	17	188	16.5	14.8	89.7
7	267	17.6	15.7	89.2	18	225	15.7	13.9	88.6
8	233	17.7	16.1	91.0	19	278	17.3	15.6	90.2
9	361	16.4	14.5	88.4	20	228	17.0	15.0	88.2
10	251	16.8	16.6	98.8					
11	254	17.0	15.3	90.0	Mean.	.....	.....	14.8	88.1

TABLE VII.—*Showing analyses of twenty sets of ten beets each of the Lemaire variety.*

[Date: October 15.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	378	17.2	15.2	88.4	12	354	16.4	13.1	79.9
2	356	16.9	13.9	82.2	13	358	15.8	12.9	81.6
3	358	17.0	14.0	82.3	14	364	16.4	13.5	82.3
4	374	17.2	14.4	83.7	15	333	16.8	13.4	79.8
5	351	17.2	14.4	83.7	16	447	16.3	13.2	81.0
6	392	17.1	15.0	87.7	17	286	16.3	14.2	87.1
7	471	16.6	13.9	83.7	18	294	16.6	13.9	83.7
8	321	16.6	13.7	82.5	19	312	16.4	14.3	87.2
9	323	16.2	13.4	82.7	20	161	16.8	14.0	83.2
10	367	16.6	13.9	83.7					
11	369	15.5	12.9	83.2	Mean.	.....	.....	13.9	83.5

TABLE VIII.—Showing analyses of twenty sets of ten beets each of the *Desprez* variety.

[Date : October 16.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	341	16.3	13.7	84.0	12	298	16.4	13.6	82.9
2	354	16.1	12.9	80.1	13	374	15.6	13.5	86.6
3	366	17.6	14.7	83.5	14	337	16.1	14.4	89.4
4	575	16.6	13.7	82.5	15	333	15.7	13.9	88.5
5	446	16.3	13.2	81.0	16	339	15.5	13.4	86.5
6	515	16.5	14.9	90.3	17	318	16.5	14.0	84.8
7	363	16.8	13.3	79.2	18	309	16.5	13.8	83.6
8	373	17.1	13.4	78.4	19	253	16.5	14.8	89.7
9	461	15.8	13.1	82.9	20	174	17.9	16.1	89.9
10	343	16.2	13.0	80.2					
11	292	16.8	14.8	88.1	Mean	.....	.....	13.9	84.6

TABLE IX.—Showing analyses of twenty sets of ten beets each of the *Desprez* variety.

[Date: October 17.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in beets.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	521	15.8	13.0	82.3	12	321	17.1	14.0	81.9
2	457	15.7	13.1	83.4	13	348	17.2	15.2	88.4
3	339	16.7	14.3	85.6	14	565	17.2	14.0	81.4
4	324	16.4	13.7	83.5	15	299	16.7	14.2	85.0
5	425	16.7	14.4	86.2	16	317	17.1	14.7	86.0
6	370	16.6	13.7	82.5	17	309	17.2	15.4	89.5
7	314	16.2	13.5	83.3	18	330	17.7	15.7	88.7
8	312	17.0	13.8	81.2	19	283	16.9	14.9	88.2
9	279	16.1	14.3	88.8	20	205	17.2	14.6	84.9
10	507	17.1	14.1	84.2					
11	366	17.3	14.3	82.6	Mean	.....	.....	14.3	84.9

TABLE X.—Showing analyses of twenty sets of ten beets each of the *Kleinwanzlebener Elite* variety.

[Date: October 19.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	392	17.5	15.5	88.6	12	364	16.9	13.2	78.1
2	396	17.4	14.3	82.2	13	468	17.1	14.8	86.5
3	392	16.9	13.5	79.9	14	381	18.4	15.4	83.7
4	506	16.9	13.0	76.9	15	330	16.7	14.2	85.0
5	396	17.7	14.7	83.0	16	357	18.0	15.0	83.3
6	523	16.2	12.8	79.0	17	377	16.5	13.9	84.2
7	362	18.1	15.1	83.4	18	384	17.7	14.5	81.9
8	335	17.8	15.0	84.3	19	334	18.0	15.0	83.3
9	378	17.9	14.9	83.2	20	403	18.2	16.0	87.9
10	396	16.6	13.2	79.5					
11	379	16.7	13.9	83.2	Mean	.....	.....	14.4	82.8

TABLE XI.—*Showing analyses of eighty beets in sets of tens of the Lemaire variety.*

[Date: October 20.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	347	16.3	14.9	91.4	6	277	16.0	14.0	87.5
2	320	16.7	14.1	84.4	7	256	16.6	15.5	93.4
3	304	16.3	14.4	88.3	8	165	16.7	14.1	84.4
4	264	17.0	15.0	88.2					
5	270	16.5	15.0	90.9	Mean.	.....		14.6	88.5

TABLE XII.—*Showing analyses of one hundred beets of the Desprez variety.*

[Date: October 20.]

No.	Average weight beets.	Sucrose in juice.	No.	Average weight beets.	Sucrose in juice.	No.	Average weight beets.	Sucrose in juice.	No.	Average weight beets.	Sucrose in juice.
	<i>Grams.</i>	<i>Per ct.</i>		<i>Grams.</i>	<i>Per ct.</i>		<i>Grams.</i>	<i>Per ct.</i>		<i>Grams.</i>	<i>Per ct.</i>
1	566	15.5	9	242	15.2	17	314	15.8	25	382	15.5
2	292	14.7	10	412	15.5	18	346	12.9	26	132	17.0
3	292	15.2	11	519	14.9	19	365	16.6	27	240	15.5
4	394	16.0	12	299	16.4	20	413	15.0	28	213	13.9
5	483	16.2	13	499	14.9	21	718	14.2	29	187	14.3
6	170	10.9	14	287	13.4	22	368	16.1	30	349	13.2
7	275	14.5	15	279	15.5	23	292	16.0			
8	347	12.6	16	162	15.2	24	475	14.2			

[Date: October 21.]

31	290	14.6	49	597	14.0	67	447	13.0	85	607	15.7
32	328	14.2	50	499	14.6	68	805	15.3	86	411	14.9
33	426	14.2	51	350	13.1	69	691	9.9	87	272	14.1
34	377	11.8	52	327	14.7	70	489	12.9	88	494	13.3
35	281	9.6	53	270	13.0	71	625	12.9	89	437	14.9
36	730	12.9	54	284	17.4	72	622	12.8	90	289	14.1
37	324	15.0	55	309	16.6	73	215	12.7	91	396	11.0
38	639	14.5	56	304	14.8	74	183	18.2	92	217	16.1
39	444	13.2	57	376	12.3	75	457	15.0	93	150	13.0
40	400	13.8	58	225	14.4	76	191	15.8	94	627	11.2
41	298	14.0	59	442	15.1	77	320	14.9	95	126	14.6
42	630	13.0	60	200	13.9	78	270	14.3	96	186	7.5
43	496	15.1	61	287	12.2	79	226	12.2	97	359	11.8
44	270	15.0	62	153	14.2	80	265	12.9	98	271	13.6
45	359	14.8	63	211	14.5	81	337	12.8	99	280	13.9
46	495	11.5	64	307	14.0	82	899	12.2	100	529	16.0
47	270	12.3	65	1,023	12.7	83	318	13.0			
48	197	12.9	66	466	14.6	84	427	13.6	Mean	.....	14.1

TABLE XII, bis.—*Showing analyses of thirty-eight sets of ten beets each of the Desprez variety.*

[Date: October 21.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	369	15.7	12.9	86.0	21	323	16.4	14.8	90.2
2	386	16.6	15.0	90.4	22	342	16.4	14.0	85.4
3	376	16.5	15.7	95.1	23	351	16.4	14.0	85.4
4	386	15.4	13.2	85.7	24	321	15.5	13.3	85.8
5	386	15.9	13.8	86.8	25	372	16.1	14.2	88.2
6	368	16.3	13.7	84.0	26	343	15.8	13.3	84.2
7	380	15.4	13.0	84.4	27	338	16.2	15.2	93.8
8	398	15.6	13.7	87.8	28	353	15.3	13.0	85.0
9	378	15.6	13.9	89.1	29	339	15.6	13.9	89.1
10	323	15.7	14.9	94.9	30	370	14.4	12.5	86.8
11	359	15.8	13.5	85.4	31	351	15.8	13.6	86.0
12	386	15.9	14.7	92.5	32	355	15.9	14.6	91.8
13	271	16.4	14.4	87.8	33	319	14.9	13.3	89.3
14	318	16.0	14.5	90.6	34	373	15.9	14.4	90.6
15	351	15.8	13.7	86.7	35	335	16.1	14.0	87.0
16	476	15.5	13.7	88.4	36	352	16.4	14.6	82.9
17	411	16.0	13.8	86.2	37	470	15.3	12.4	81.0
18	380	15.9	13.7	86.1	38	366	15.6	14.5	93.0
19	312	15.6	13.0	83.3					
20	298	16.2	14.0	86.4	Mean	-----	-----	14.0	87.7

TABLE XIII.—*Showing analyses of sixty-six sets of ten beets each of the Vilmorin variety.*

[Date: October 22.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	372	15.4	12.4	80.5	35	536	16.0	13.3	83.1
2	382	15.5	13.3	85.8	36	464	16.3	13.9	85.3
3	368	16.7	13.8	82.6	37	340	16.3	13.0	79.8
4	381	15.6	13.1	84.0	38	343	15.4	13.2	85.7
5	390	16.1	13.2	82.0	39	384	15.3	12.9	84.3
6	363	16.0	15.0	93.7	40	365	16.0	14.2	88.8
7	384	15.9	13.6	85.5	41	396	15.5	13.2	85.2
8	389	14.7	12.6	85.7	42	377	16.1	13.4	83.2
9	356	16.1	15.0	93.2	43	384	15.1	13.3	88.1
10	368	16.4	14.2	86.5	44	386	16.1	14.0	87
11	331	15.7	13.0	82.8	45	385	15.5	12.2	78.7
12	758	16.3	14.1	86.5	46	317	16.6	13.9	83.7
13	351	16.6	15.5	93.4	47	359	14.7	13.4	91.2
14	355	16.4	13.7	83.5	48	359	15.2	12.0	78.9
15	366	15.5	13.2	85.2	49	296	15.7	13.2	84.1
16	377	15.5	13.6	87.7	50	233	16.0	14.0	87.5
17	366	15.4	12.4	80.5	51	353	16.4	14.0	85.4
18	352	16.2	14.2	87.7	52	292	16.0	14.7	91.0
19	341	16.0	14.6	91.3	53	335	15.8	13.7	86.7
20	362	15.8	13.8	87.3	54	357	14.5	13.2	91.0
21	342	15.2	13.6	89.5	55	353	16.0	13.9	86.9
22	315	15.3	13.4	87.6	56	328	15.7	13.2	84.1
23	363	15.9	12.8	80.5	57	309	16.2	14.1	87.0
24	357	16.2	14.0	86.4	58	290	16.5	13.9	84.2
25	361	16.8	13.8	82.1	59	372	16.9	14.8	87.6
26	321	16.5	14.0	84.8	60	392	15.9	13.2	83.0
27	371	16.1	14.8	91.9	61	198	17.1	15.2	88.9
28	376	15.7	13.4	85.4	62	284	15.5	14.3	92.3
29	321	15.3	13.0	85.0	63	243	15.4	12.2	79.2
30	291	15.7	13.0	82.8	64	238	16.3	13.6	83.4
31	410	15.9	13.5	84.9	65	243	16.4	15.0	91.5
32	350	16.5	14.8	89.7	66	185	17.0	14.5	85.3
33	495	15.6	13.0	83.3					
34	366	15.0	12.8	85.3	Mean	-----	10.0	13.4	85.8

TABLE XIV.—Showing analyses of sixty-two sets of ten beets each of the *Kleinwanzlebener* variety.

[Date: October 23.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	361	15.4	14.4	93.5	26	452	11.6	13.0	78.3
2	396	15.4	12.3	79.9	27	459	16.9	14.1	83.4
3	397	16.8	14.6	86.9	28	443	15.9	13.4	84.3
4	383	16.8	14.8	88.1	29	379	17.4	14.9	85.6
5	397	16.3	14.7	90.2	30	397	17.0	14.5	85.3
6	386	17.4	15.0	86.2	31	387	16.8	14.7	87.5
7	390	16.0	12.9	80.6	32	589	17.0	14.3	84.1
8	394	16.4	14.9	90.9	33	390	17.1	14.4	84.2
9	379	16.7	14.3	85.6	34	361	16.3	13.2	81.0
10	394	16.7	14.2	85.0	35	369	16.6	13.3	80.1
11	387	17.2	13.9	80.8	36	373	16.8	13.8	82.1
12	371	16.5	13.9	84.2	37	394	16.9	14.7	87.0
13	374	16.4	14.8	90.2	38	384	16.7	13.7	82.0
14	664	17.0	13.6	80.0	39	396	16.9	14.2	84.0
15	439	16.6	13.7	82.5	40	386	17.4	14.5	83.3
16	441	15.3	12.2	79.7	41	383	17.2	14.9	86.6
17	459	14.6	12.0	82.2	42	378	17.1	14.4	84.2
18	360	16.5	13.9	84.2	43	377	16.0	14.2	88.8
19	562	16.1	13.0	80.7	44	549	16.8	13.9	82.7
20	475	16.3	13.2	81.0	45	352	17.4	14.9	85.6
21	451	17.2	14.5	84.3	46	371	17.0	14.5	85.3
22	503	16.0	13.3	83.1	47	374	17.9	15.2	84.9
23	463	16.3	13.4	82.2	48	366	16.5	13.7	83.0
24	527	17.3	14.9	86.1	49	383	17.6	14.3	81.2
25	459	16.5	13.6	82.4	50	374	17.6	14.8	84.1

[Date: October 24.]

51	356	17.0	13.9	81.8	58	326	16.4	13.4	81.7
52	340	16.6	14.0	84.3	59	318	16.9	14.3	84.6
53	324	18.0	14.5	80.6	60	358	16.2	13.0	80.2
54	379	16.7	13.8	82.6	61	360	16.4	13.9	84.8
55	355	17.3	14.0	80.9	62	409	17.1	14.4	84.2
56	349	16.7	13.9	83.2					
57	360	16.9	14.1	83.4	Mean	-----	-----	14.1	83.8

TABLE XV.—Showing analyses of twenty sets of ten beets each of *Kleinwanzlebener elite* variety.

[Date: October 31.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	454	16.5	13.4	81.2	12	357	16.2	13.9	85.8
2	289	16.9	13.9	82.2	13	333	16.6	14.3	86.1
3	325	17.2	14.5	84.3	14	297	17.4	14.4	82.7
4	344	17.4	14.8	85.1	15	302	16.9	14.1	83.5
5	351	16.9	14.0	82.8	16	304	17.1	14.4	84.2
6	357	16.8	13.2	78.6	17	296	17.0	14.3	84.1
7	341	17.9	14.8	82.7	18	274	17.4	14.4	82.7
8	347	15.9	13.7	86.1	19	221	17.3	15.0	86.7
9	256	16.2	14.4	88.9	20	239	17.1	13.7	80.1
10	369	16.2	14.3	88.3					
11	371	17.1	14.0	81.9	Mean	-----	-----	14.2	83.9

TABLE XVI.—*Showing analyses of twenty sets of ten beets each of the Ferdinand Knauer variety.*

[Date: November 2.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	386	15.6	12.0	76.9	12	387	15.7	13.1	83.4
2	386	16.3	13.2	81.0	13	394	16.3	13.4	82.2
3	375	16.1	13.3	82.6	14	342	16.4	13.5	82.3
4	363	14.6	11.7	80.1	15	290	16.4	13.7	83.5
5	370	14.8	11.6	78.4	16	246	17.5	14.8	84.6
6	394	15.1	11.7	77.4	17	290	17.3	14.4	83.3
7	416	16.4	13.5	82.3	18	224	16.2	13.8	85.2
8	355	15.8	12.9	81.6	19	170	16.6	14.4	86.7
9	315	16.5	13.2	80.0	20	140	15.7	13.9	88.5
10	317	17.1	14.2	83.0					
11	360	15.9	12.5	78.6	Mean	.....	.....	13.2	82.1

[Date: November 2.]

TABLE XVII.—*Showing analyses of twenty sets of ten beets each of the Lemaire variety.*

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	370	15.5	12.9	83.2	12	390	15.8	12.5	79.1
2	387	16.0	12.8	80.0	13	380	15.8	12.7	80.4
3	318	16.0	13.8	86.2	14	565	15.5	11.9	76.8
4	389	15.7	12.6	80.3	15	380	15.2	12.2	80.3
5	379	16.9	13.3	78.7	16	370	16.3	13.5	82.8
6	529	15.5	12.4	80.0	17	349	15.8	12.0	75.9
7	376	15.0	12.0	80.0	18	361	14.3	11.3	79.1
8	535	15.3	11.2	73.2	19	391	16.3	13.7	84.0
9	330	15.7	13.2	84.1	20	663	15.3	12.2	79.7
10	342	15.8	12.6	79.7					
11	358	15.9	12.7	79.8	Mean	.....	.....	12.6	80.0

TABLE XVIII.—*Showing analyses of twenty sets of ten beets each of the Desprez variety.*

[Date: November 2.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	382	15.5	12.7	81.9	12	502	15.3	12.0	78.4
2	350	15.9	13.3	83.6	13	339	15.4	13.1	85.1
3	392	15.7	12.0	76.4	14	371	15.6	12.7	81.4
4	391	15.9	13.0	81.8	15	391	16.2	12.6	77.8
5	556	14.8	11.5	77.7	16	559	15.1	12.2	80.8
6	389	16.4	13.8	84.1	17	383	15.0	11.5	76.6
7	382	15.3	12.4	81.0	18	379	15.8	12.8	81.0
8	373	15.4	12.6	81.8	19	395	14.9	11.9	79.9
9	481	16.0	12.8	80.0	20	389	15.5	13.0	83.9
10	466	16.2	13.4	82.7					
11	341	15.6	13.0	83.3	Mean	.....	.....	12.6	80.9

TABLE XIX.—*Showing analyses of twenty sets of ten beets each of the Vilmorin variety.*

[Date: November 2.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	465	15.1	11.8	78.1	12	210	15.5	13.2	85.2
2	329	15.7	13.7	87.3	13	248	16.1	13.7	85.1
3	361	15.3	12.8	83.7	14	317	15.8	13.5	85.4
4	326	15.2	12.5	82.2	15	365	15.3	13.0	85.0
5	446	15.2	12.4	81.6	16	360	15.3	12.4	81.0
6	382	15.3	12.5	81.7	17	351	15.8	13.3	84.2
7	382	15.8	13.2	83.5	18	334	15.7	13.6	86.6
8	298	16.0	13.0	81.2	19	261	15.9	13.5	84.9
9	347	15.7	12.6	80.3	20	267	17.0	14.3	84.1
10	286	15.1	13.3	88.1					
11	236	16.3	13.7	84.0	Mean	.....	.....	13.1	83.6

TABLE XX.—*Showing analyses of twenty sets of ten beets each of the Kleinwanzlebener variety.*

[Date, November 2.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	354	16.8	12.9	76.8	12	369	17.1	14.1	82.4
2	366	16.3	12.5	76.7	13	546	16.7	13.3	79.6
3	509	15.8	11.8	74.7	14	522	16.1	13.0	80.7
4	510	16.1	11.9	73.9	15	398	16.5	13.2	80.0
5	358	16.8	13.9	82.7	16	575	16.7	12.9	77.2
6	367	16.2	12.4	76.5	17	374	16.8	13.4	79.8
7	360	15.5	11.9	76.8	18	367	16.6	13.9	83.7
8	379	15.8	12.3	77.8	19	302	16.8	13.8	82.1
9	365	16.6	13.4	80.7	20	385	16.5	13.8	83.6
10	555	15.6	12.2	78.2					
11	559	15.8	12.9	81.6	Mean	.....	.....	13	79.7

TABLE XXI.—*Showing analyses of six sets of ten beets each of Plat No. 1.*

[Date: October 26.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	281	16.8	13.6	80.9	5	283	16.7	13.6	81.4
2	227	16.3	13.5	81.8	6	288	16.0	12.7	79.4
3	269	17.3	14.1	81.4					
4	331	16.6	13.2	79.5	Mean	.....	.....	13.5	80.8

TABLE XXII.—*Showing analyses of six sets of ten beets each of Plat No. 2.*

[Date: October 26.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1	222	16.2	13.4	82.7	5	256	15.7	13.4	85.4
2	226	16.7	13.7	82.0	6	224	15.4	13.0	84.4
3	248	16.2	12.8	79.0					
4	241	15.0	12.1	89.7	Mean	.....	.....	13.1	82.7

TABLE XXIII.—Showing analyses of six sets of ten beets each of Plat No. 3.

[Date: October 27.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1.....	243	15.8	12.3	77.8	5.....	253	16.4	13.4	81.7
2.....	303	16	12.7	79.4	6.....	210	15.6	12.9	82.7
3.....	250	15.8	12.6	79.7					
4.....	273	16.3	13.7	84	Mean.	.....	.....	12.9	80.9

TABLE XXIV.—Showing analyses of six sets of ten beets each in Plat No. 4.

[Date: October 27.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1.....	250	16.4	12.9	78.7	5.....	285	15.5	12.9	83.2
2.....	282	16.5	13.5	81.8	6.....	221	15.7	12.6	80.3
3.....	303	16.0	12.2	76.3					
4.....	289	16.0	12.8	80.0	Mean.	.....	.....	12.8	80

TABLE XXV.—Showing analyses of six sets of ten beets each from Plat No. 5.

[Date: October 28.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1.....	350	16.6	12.8	77.1	5.....	343	15.7	12.4	79
2.....	357	16.4	12.6	76.8	6.....	282	15.9	12.2	76.7
3.....	355	15.3	12.2	79.7					
4.....	377	16.6	12.8	77.1	Mean.	.....	.....	12.5	77.7

TABLE XXVI.—Showing analyses of six sets of ten beets each from Plat No. 6.

[Date: October 28.]

No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.	No.	Average weight beets.	Solids in juice.	Sucrose in juice.	Purity.
	<i>Grams.</i>		<i>Per cent.</i>			<i>Grams.</i>		<i>Per cent.</i>	
1.....	243	16.4	13.6	82.9	5.....	293	15.4	12.2	79.2
2.....	255	16.5	13.3	80.6	6.....	243	15.7	12.5	79.6
3.....	288	16.0	12.6	78.8					
4.....	325	16.6	13.6	81.9	Mean.	.....	.....	12.9	80.5

MISCELLANEOUS.

PROCESS FOR THE PRODUCTION OF SUGAR-BEET SEED BY CUTTINGS.

Andreas Nowoczek, of Kaaden, Bohemia, has patented a process in Germany for the production of improved sugar-beet seed by cuttings from the mother beet. The process consists in taking the buds from the axis of the leaves and cutting them out with as little as possible of the flesh of the beet adhering thereto. These buds are treated with an antiseptic to prevent them from decay and to prevent the ground worms from eating them. The material chosen for the antiseptic is powdered charcoal. These buds are planted in beds and produce beets of average size which, it is claimed, have all the properties of the mother beet from which they were taken. The beets as produced can be planted for seed in the usual way. It is claimed for the process that the excellent qualities of the mother beet are much better preserved by this method than by the usual method of planting it for seed directly.

LETTER FROM MR. HENRY T. OXNARD ON THE PROSPECTS OF THE BEET-SUGAR INDUSTRY IN THE UNITED STATES.

GRAND ISLAND, NEBR.,

November 7, 1891.

DEAR SIR: I esteem it a pleasure and an honor to be able to write a few words briefly regarding the development of the beet-sugar industry and the condition in which it exists in the United States to-day. The beet-sugar industry has become well established in Europe only within the last half century, and has become a great factor in the world's sugar supply within the past fifteen years, so that to-day more sugar is produced from beets than from all the other sugar-producing plants of the world combined. This result has been brought about within the last fifty years by the Governments of Europe, chiefly Germany and France, subsidizing and encouraging the production of sugar to such an extent as to diminish the price of that article at least one-half what it was ten years ago. The United States, as you well know, has, within the past year, by a wise provision of the McKinley bill, offered a bounty of 2 cents per pound for a limited period for all sugar produced in the United States, and by following the example of Germany and France can soon hope to become independent of the rest of the world for the supply of its sugar, thereby keeping at home some hundreds of millions of dollars sent abroad annually to enrich the farmers and manufacturers of foreign countries. The 2 cents given in the shape of a bounty by the United States Government takes the place of the 2 cents which formerly existed as a tariff on the importation of sugar. The result of this legislation is, that the price of sugar since the law went into effect has fallen 2 cents per pound, the consumer paying just 2 cents less than a year ago, and at the same time the development of the home industry has not been sacrificed, but encouraged, and that is not the only advantage we shall derive, as each factory, similar to the one we have built here, means an outlay of about half a million dollars, and the United States will require about a thousand of such factories to supply it with sugar in 1900. The building of these factories will start up the coal and iron mines as well as the ma-

chine shops all over the United States, giving employment directly to thousands, and give a far greater impetus to our national prosperity than could be obtained in any other channel. We will also give our farmers an opportunity to diversify their crops, and we all know the advantage to be derived from that source. Under the old tariff the industry never thrived, but with the stimulus of the bounty, within the past eight months, beet-sugar factories have started or are about to be started all over the United States. At least twenty States are, in my opinion, well adapted to the sugar beet. We have the soil, climate, and capital necessary to become the greatest sugar-producing country in the world, and as soon as we have acquired the knowledge of the industry which will enable us to compete successfully with those countries of Europe, with the aid of the stimulus given by our last Congress, we can hope to lead the world in the production of sugar in the next fifteen or twenty years.

But the supply of the home article is not the only advantage to be gained. I refer to the effect of the beet crop on the soil. Properly carried on the cultivation of the sugar beet is greatly beneficial to all other agriculture. The deep and careful cultivation which the beet requires greatly improves the land, the soil becoming thereby deepened and the disintegration and solution of the mineral constituents greatly accelerated. The tap root of the beet descends to a great depth, loosening the soil which most other plants fail to reach. The nourishment thus obtained passes partly into the leaves and is left with them on the ground at the time of harvest, and to-day in Europe the farmers are anxious to plant beets, as they find their next crop grown on the same soil is increased 33 per cent. The pulp, after the sugar is removed, makes an excellent food for fattening cattle, and can be sold to the farmers for little or nothing after paying them liberally for the privilege of extracting the sugar.

We have in operation this fall three beet-sugar factories, each with a capacity of 300 tons of beets daily, besides which each factory uses about 50 tons of coal and 40 tons of limestone daily, spending in the immediate neighborhood of the factory each and every day upwards of \$2,000 amongst the farmers for the beets and laborers working in the factory, keeping that amount at home which formerly found its way to the pockets of the European farmers and laborers. This large sum is distributed in the community immediately surrounding each one of our factories, and the result has been to build up the towns where our factories are located as well as the surrounding farming district; these towns in turn build up the State. Since the establishment of our factories in each community where situated the demand for labor has so far exceeded the supply that not a single individual wishing to work has lacked the opportunity of finding remunerative employment either in the field or factory. The Oxnard Beet Sugar Company, located at Grand Island, Nebr., was built and operated for a short time last year, working very satisfactorily. This year our company has built two new factories, locating them at Norfolk, Nebr., and Chino, Cal. Both of these factories commenced operations for the first time this year and are now turning out a standard grade of fine white granulated sugar which sells readily in competition with the sugars offered by the large refineries. We expect to manufacture 9,000,000 pounds of granulated sugar in our three factories this year. Besides ours there are three other beet-sugar factories at present in operation, and the number will be largely increased next year, spreading all over the northern and central portion of the United States. It is with pleasure that I can inform you, after a very careful study of the subject and practical trial of same, that a most brilliant future and speedy development awaits this new industry.

I remain, very sincerely and respectfully yours,

HENRY T. OXNARD.

Hon. J. M. RUSK,
Secretary of Agriculture.



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